SCHRADER'S SPREE PSINet CEO William Schrader has bought 50 ISPs worldwide. Page 33.

CLEANING UP WITH VPNS Patrick Prue is using VPN technology to cut costs at vacuum cleaner maker Fantom. Page 21.

The newsweekly of enterprise network computing

NetworkWorld

October 25, 1999 Volume 16, Number 43

The network portal: www.nwfusion.com

Internet pioneer Vint Cerf says now is the time to be moving to IPv6.

Cisco Powered Network program fails to move users

BY JIM DUFFY

Service providers have few complaints, but say Cisco's CPN program hasn't generated much new enterprise business.

SAN JOSE — More than two years after its launch, Cisco's joint marketing program for service providers is generating little demand from enterprise network customers looking for next-generation IP services.

Cisco kicked off the Cisco Powered Network (CPN) program in June 1997, in an effort to increase its visibility and sales in the service provider realm, and to raise the profile of customers who use Cisco equipment.

The ultimate goal of the CPN program is to create new services for the enterprise market, such as virtual private networks (VPN), IP telephony and application hosting, says Kevin Outcalt, Cisco's CPN program director.

"What we really wanted to do was to work with the service providers that were Cisco-based and give them the capability to enable Internet services for their customers," Outcalt says.

See **CPN**, page 84

Bid to allow 'Net wiretaps draws fire

BY CAROLYN DUFFY MARSAN

Citing security risks, network managers are lining up to oppose a proposal within the Internet engineering community to develop protocols that would make it easier for law enforcement agencies to intercept communications

See **Wiretap**, page 14

More Online

A RIGHTS VIOLATION?

Participants in our forum are up in arms over 'Net wiretapping. "If I have committed no crime why are my civil rights being suspended? If I have committed a crime why am I not in jail?" one reader asks. What do you think?

Discuss it on 5230 on Usenet

www.nwfusion.com

NDS gap puts users in a bind

Lost feature complicates NetWare/Win 2000 mgmt.

BY JOHN FONTANA

Novell CEO Eric Schmidt says Win 2000 will bring changes to NDS shops.

STEVE BORNS

PROVO, UTAH — Novell has quietly shelved a key directory-integration tool, which will likely force IT executives with mixed environments to make an either/or choice between NetWare and Microsoft's forthcoming Windows 2000.

And that choice may not be good news for Novell.

At issue is the redirect capability of Novell Directory Services (NDS) for NT. Redirect allows users to reroute authentication and access-control calls made to NT 4.0 domains into NDS, which nearly eliminates user management on NT servers.

However, in NDS 8 for NT, the next version of the software, redirect is being replaced by a bidirectional synchronization tool called DirXML.

The switch means NDS shops will no longer be able to sidestep administration in the Microsoft environment if they upgrade to Windows 2000 Active Directory.

Administrators will have to manage both network operating system directory services.

"I'm concerned about the immediate absence of redirect," says Peter Cruikshank, network architect for the U.S.

See **Novell**, page 18

Are VLANs on the comeback trail?

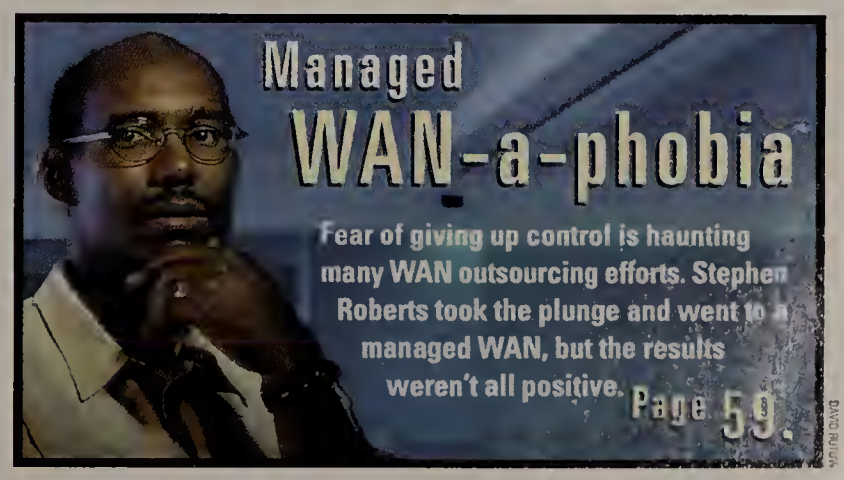
BY JEFF CARUSO

After stumbling out of the limelight a few years ago, virtual LANs may be poised for a comeback, thanks to the efforts of two standards bodies.

The IEEE has two projects under way: One that would standardize the practice of segmenting VLANs by protocol, and another that would make VLANs more resistant to failures. In addition, the Internet Engineering Task Force (IETF) is crafting a way for third-party software to manage multivendor VLANs.

The advancements — which build on the standardization of VLAN tagging in IEEE 802.1Q last year — are renewing interest in the technology, even if some analysts say Layer 3 switches do away with the need for VLANs (see story, page 10). A recent Infonetics Research survey found that

See **VLANs**, page 10



DAVID RUSS

BLAH, BLAH, YAK, YAK, YADA, YADA, YADA.

COMPAQ KEEPS THE WORLD'S TOP 35 TELCOS TALKING.

"Come here, Watson." The immortal words of Alexander Graham Bell. The world hasn't been able to shut up about it ever since. Every day billions and billions of phone calls are connected. Smoothly. Effortlessly. Thanks in no small part to Compaq. Telcos depend on Compaq *NonStop*™ eBusiness Solutions for both reliability and scalability. That's incredibly important by the way. Enough so that even *we* can't shut up about it. To find out more, click on www.compaq.com/NonStop.

24x7x COMPAQ

BUILD A GREAT SITE AND THEY WILL COME.

MAKE THEM WAIT EIGHT SECONDS AND THEY WILL LEAVE.

Studies show that if Web users have to wait longer than 8 seconds for pages to download, chances are they're history. Conventional technology has focused on rocketing packets from A to B. But because Web traffic is unpredictable, event-driven, and conversational, managing it requires intelligence, as well as speed.

The carrier-class CS-800 supports 7 billion hits per day and scales to 1 million concurrent flows per Web switch.

ArrowPoint's Content Smart™ Web Switch is the only Web switch designed specifically for the rigors of the next generation, e-business Internet. Only ArrowPoint's URL switching sends content *requests* to the best site and server based on real-time application and content availability – bringing an end to "Server Not Found." But we don't stop there, because only ArrowPoint also optimizes content *delivery* – 90% of today's Web traffic – using the best server located anywhere in your distributed network.

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ArrowPoint, the Web switching pioneer, is already on the job providing intelligence and performance with content smart Web services for some of the world's leading Web hosting, broadband and e-commerce companies. Check out our Web site to see what we can do for you.

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OCTOBER 25, 1999

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Sexism in IT. A reader says she's tired of being mistaken for a booth babe and "can't afford the necessary plastic surgery to make me ugly." Her colleagues ignore her suggestions but take the same advice from male colleagues. "Not only have I pulled cable, I have climbed through cable ducts and piloted cherry pickers," she says. Is sexism alive in IT? **DocFinder: 5239**

Keeping current. Setting your Web strategy can be a daunting task. How high up the food chain should this effort go? Fred McClimans says getting the right people involved can make or break your online effort. **DocFinder: 5238**

Feeling insecure? Catch up on the latest security patches with our Security Alert area. Each day, we update the database to include bug fixes for some of the most common network packages. From Red Hat Linux to Java to Hewlett-Packard's net management software, we've got you covered. **DocFinder: 4735**

In search of Dilbert's mom. Dilbert used to be the ubergeek who explained networking to his clueless boss and was upbraided by his network-engineer mom. But now he's hawking office supplies. So where do you go for a good dose of network humor? Online Editor Adam Gaffin descends to the depths of "The Bastard Operator from Hell" and seeks enlightenment from CaveBear's Super Networking Performance Products Catalogue. **DocFinder: 5240**

The daily dish. Network World has expanded its lineup of daily news. Each day, we post more than a dozen breaking stories to keep you in the know about what's happening in the network industry. Our expert staff offers you up-to-the-minute reports from around the world. And you can have free daily digests sent straight to your desktop when you sign up for our NetFlash newsletter. **DocFinder: 3850.**

John Sturm took a crash course in Web technologies to prepare for his new Internet-based job. Page 69.

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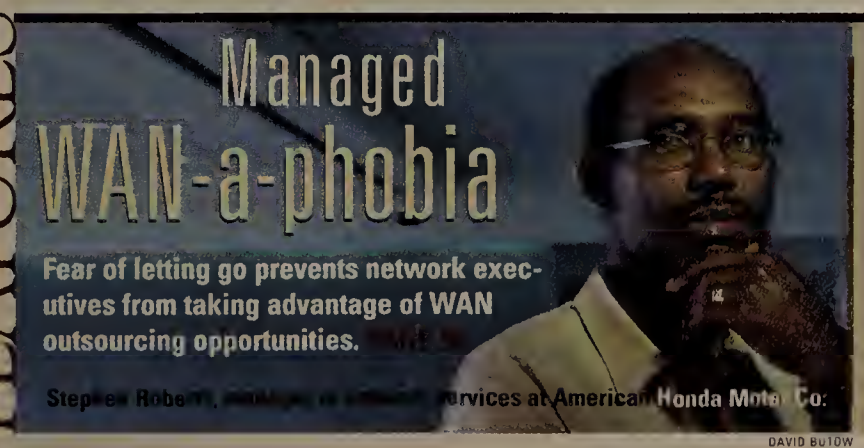

DAVID BUTOW

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REVIEW: SMARTS' InCharge Switch Connectivity Manager: Sophisticated, powerful — pricey. **Page 67.**

NEWS BRIEFS, OCTOBER 25, 1999

Slamming complaint 'dogs' Qwest

The Federal Communications Commission last week nailed Qwest on a slamming complaint and gave the carrier 30 days to show why it should not be fined $2.08 million.

Slamming is the practice of changing someone's long-distance carrier without explicit authorization. The complaint involves 30 consumers, one of whom alleged that Qwest switched his carrier on the basis of an authorization "signed" in the name of his deceased dog, Boris. (The subscriber had listed his number in his dog's name in the telephone directory for privacy reasons.)

In another case, the complainant said the authorization letter presented by Qwest was signed in the name of her husband, who died eight years ago.

Some of the complaints originated with LCI International, a carrier Qwest acquired last year. Qwest released a statement saying it disapproves of slamming and is taking measures to prevent it.

Sun takes a shine to NetBeans . . .

Sun last week rounded out its development tools products by acquiring NetBeans, a Czech Republic company with about 40 developers, and finalizing its acquisition of Forté Software. Sun would not disclose the terms of the NetBeans deal.

NetBeans' products are widely used for building fairly simple Java applications on the Linux operating system, Sun says. For more complex, distributed Java applications, Sun now offers Forté for Java Enterprise Edition — formerly Forté Software's SynerJ product. Forté is now a wholly owned Sun subsidiary.

. . . and bets $200M on Java start-ups

Sun also said it was ponying up $200 million and forming an investment fund to back Internet start-ups that are betting their future on Sun's Java and related products and services.

Jonathan Schwartz, formerly the vice president for Sun's development tools group, was named to head the fund, called Sun Equity Investment Portfolio.

The fund will work with venture capitalists and investment banks to take minority stakes in fledgling Internet companies.

Besides the money, Sun will offer all the sage advice, contacts, shrewd marketing ideas and other neat stuff one expects from a venture capitalist.

Cisco, Polycom put phones together

Cisco and Polycom last week said they have entered into a five-year joint development, licensing and sales agreement for IP telephony.

Cisco will incorporate Polycom's Acoustic Clarity Technology into the next generation of Cisco's IP telephony handsets. The companies will also integrate Cisco IP telephony technology into the next-generation of Polycom's SoundStation conference phone, and incorporate Cisco's AVVID Open Telephony interface into future Polycom IP telephones and other endpoint products.

For news on Polycom's latest videoconferencing systems, see story, page 24.

NetManage snaps up a competitor

The slowly shrinking number of players in the host access market shrank a little more last week. PC connectivity software provider NetManage announced the acquisition of its one-time competitor, the troubled Wall Data.

With this move, NetManage gets Wall Data's 10,000-strong customer base as well as its line of RUMBA PC-to-host software products. Wall Data had recently launched a line of Java and ActiveX-based products that NetManage felt would complement its own ViewNow host connectivity and thin-client products.

The deal was valued at about $94 million.

Intel unwraps faster chipsets

Intel today will unveil a slew of faster chipsets for servers that allow processing from a low-end 600 MHz to a high-end 733 MHz.

Code-named Coppermine and Cascades, the chipsets use new .18-micron technology and a 133-MHz system bus, which allows the servers they are installed in to run at higher rates for less money. These chipsets will replace Intel's slower .25-micron technology.

Coppermine chipsets will be used in Pentium III servers, while Cascades chipsets will be installed in Pentium III Xeon-based servers.

Hewlett-Packard, Compaq and IBM are expected to upgrade their servers to use the faster chipsets. Only Dell has a Coppermine-equipped server ready today. The Dell PowerEdge 2400, a dual-processor Pentium III machine, features an embedded network adapter and RAID controller, as well as high-availability features, such as hot-pluggable peripheral bays, power supplies and disk drives.

IBM bolsters wares for mixed NT-AS/400 nets

Firm will let users attach NT machines to AS/400.

BY MARC SONGINI

SOMERS, N.Y. — IBM is juicing up the capabilities of its mixed Windows NT-AS/400 systems.

During the next year, the company intends to enhance the performance and memory of its AS/400 Integrated Netfinity Server card, and even let users attach external Windows NT servers to the AS/400.

IBM is prepping a faster Netfinity card for customers running NT applications on AS/400s.

This will allow users to run high-end NT symmetrical multiprocessing (SMP) applications, such as enterprise resource planning programs, without sacrificing the benefits of the integrated NT AS/ 400 system. Today such applications cannot run on the card alone.

The Integrated Netfinity Server card fits into a PCI slot on the AS/400 and exploits the storage and power of that machine.

The card has an Intel chip and a copy of the Windows NT operating system and can be managed as a part of the AS/400.

Organizations that don't want to learn NT skills but like some of that operating system's features find the card a better alternative than a stand-alone NT box, says IBM.

Better alternative

But the external-server capability makes sense for applications that will only run on a Windows NT box, according to Gary Cornell, vice president of IT at LDG Reinsurance Corp. in Wakefield, Mass.

However, Cornell says he is currently content with just his server cards. His company was able to replace a half-dozen NT servers with three cards sitting on one AS/400, freeing up needed space those servers had been occupying.

In previous years, IT shops used the NT card to run file and print applications in their AS/400 networks, but as NT has matured, users have expanded the applications they are running on the card, necessitating a boost in performance and memory, says Ted Scharf, an IBM marketing manager.

More memory

Next year, IBM intends to increase the memory on the card from 1G byte to 4G bytes and storage from 128M bytes to multiple terabytes, he says.

Additionally, the current 333-MHz Intel chip will be replaced by one running at speeds as high as 600 MHz.

Down the line, the company will also select a Netfinity model that can scale to two or more CPUs and, using a PCI card, allow it to attach to the bus of the AS/400.

The box, called the External Integrated Netfinity Server, will be able to run applications the card can't handle, custom-tailored NT applications, or to support thin clients.

See **IBM**, page 14

Nortel buys customer relationship firm for $2.1 billion

BY DAVID ROHDE

SAN JOSE — Nortel last week ponied up another couple of billion dollars in its effort to bolster integration between telephony call centers and Web-based electronic commerce.

The vendor bought Clarify, the No. 2 maker of customer relationship management (CRM) software. Clarify produces software that call center and help-desk agents, mobile salespeople and logistics managers use to consult and update customer records and assist in sales.

Clarify recently bundled its software into a suite called eFrontOffice, which attempts to provide consistent sales-history information on a customer-by-customer basis to agents handling both e-commerce and telephony transactions.

PROFILE: CLARIFY

SOLD TO NORTEL NETWORKS FOR $2.1 BILLION

Headquarters:	San Jose
Founded:	1990
Primary business:	Call center products and sales support application suites.
Key officers:	Tony Zingale, president and CEO; Randy Raynor, CTO
1998 revenues:	$130.5 million
Employees:	800
Sales channels:	Direct and indirect
Web site:	www.clarify.com

The $2.1 billion purchase follows Nortel's August announcement that it would acquire Periphonics, an interactive voice response vendor that also has moved into the arena of Web call center integration. The Clarify deal follows last week's purchase of No. 3 CRM vendor Vantive by enterprise software vendor PeopleSoft.

The CRM market leader, Siebel Systems, remains independent, but not without a partner — its software is resold by Lucent, Nortel's neck-and-neck competitor for call center telephony switches. Bill Conner, executive vice president at Nortel, says Nortel is seeking tighter integration between telephony and Web technologies than the company thought was possible through a reseller agreement.

Nortel's move comes at a huge price — almost five times as much as PeopleSoft paid for Vantive, and 10 times Clarify's expected revenue for this year. Susan King, Nortel's vice president for customer care solutions, justified the price by pointing to Clarify's "solid workflow architecture" — integration with back-office systems is considered key to CRM installations — and work in both telephony and e-commerce environments.

Clarify also brings Nortel a gold-plated customer list, including Best Buy, British Telecom, Compaq, First USA, General Electric, Gillette and Prudential.

Clarify will become a wholly owned Nortel subsidiary with headquarters in San Jose. ◪

SBC pushes toward converged net

$6 billion upgrade should mean broadband access to most customers.

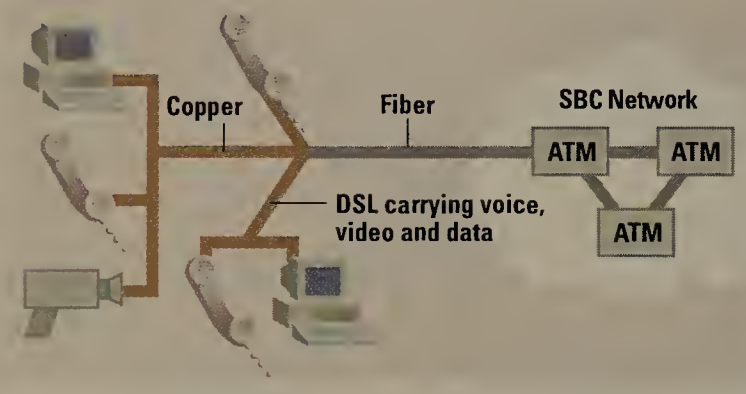
BY TIM GREENE AND DENISE PAPPALARDO

SAN ANTONIO, TEXAS — Most customers can expect IP voice and data to be delivered over a single line once SBC Communications finishes an ambitious three-year, $6 billion build-out of optical fiber in its network.

SBC adds fiber to its network

With a $6 billion investment by SBC to put optical fiber closer to customers and ATM in its core network, customers can expect converged voice, video and data services.

- DSL at guaranteed 1.5M bit/sec downloads.
- Multiple voice channels on the same line with data.
- ATM for service-quality guarantees and more efficient trunking.



Announced last week, the overhaul features fiber to the curb that will enable broadband access to 80% of SBC's customers via digital subscriber line (DSL). The network backbone will be converted to ATM, making it possible for the company to run voice and data over a single infrastructure and ensure quality of service.

Dubbed Project Pronto, the plan will make it possible for 80% of SBC customers to get 1.5M bit/sec DSL downloads over regular copper phone lines, while 60% will be able to get 7M bit/sec downloads. The same circuits will support multiple packet-voice channels simultaneously. In addition, 100,000 T-1 lines that require expensive repeaters will be replaced with fiber, making the lines less expensive to maintain. The move will also make it easier to turn up more bandwidth for SBC's customers.

Project Pronto will cut SBC operating expenses to such a degree that the $6 billion build-out cost will be offset, SBC says. But the company has made no commitment to pass along those savings to customers.

Some users think the upgrade will mean better data services down the road, after SBC gets permission to sell long-distance services in its region, which includes SBC's original territory plus Pacific Bell's and Ameritech's areas. The company also owns Southern New England Telephone in Connecticut.

"The SBC-Ameritech area is huge now," says Mort Rahimi, vice president of IT at Northwestern University in Chicago. "If they build very high-speed networks to provide connections in-region and they have holdings on the East and West Coasts, that will make them one of the top companies to work with."

SBC has the potential to be a top-tier carrier among the ranks of AT&T and WorldCom, but it will have to develop compelling products and pricing to keep from losing customers, he says.

"Their No. 1 issue is tying down customers," Rahimi says. "Once you lose them, it's very hard to get them back. The hassle of changing is too much to make me change unless there is a huge difference."

SBC's strategy parallels that of AT&T, which is committed to offering widespread broadband services and voice. The difference is that AT&T will use cable networks rather than DSL.

Voice over DSL is a daring move because it will directly compete with SBC's existing voice services. But in areas where copper phone lines are running out — such as parts of California — voice over DSL could be a less expensive way to set up additional phone lines, says Claudia Bacco, an analyst at TeleChoice, a telecom market research firm in Boston.

Meanwhile, SBC needs help to extend its local network beyond its current home area, SBC Chairman Edward Whitacre says. The company agreed to sell local service in 30 cities outside its home territory as part of a deal to win Federal Communications Commission permission to buy Ameritech. Whitacre says that SBC will likely acquire another company to help it meet that obligation.

The company also needs to clean up its hodgepodge of wireless holdings and settle on a single wireless technology so its customers can roam without losing service. SBC's many acquisitions have given it traditional analog cellular, digital cellular, global system for mobile communications (GSM) and Code Division Multiple Access personal communications service (PCS) wireless networks.

That means a customer in California who signs up for PacBell's GSM-based PCS service cannot roam to SBC's analog cellular networks, says Michael King, research analyst at Meta Group, a consulting firm in Stamford, Conn.

It would make sense for SBC to acquire VoiceStream Wireless, a GSM provider, says Bob Egan, research director at the Gartner Group, a Stamford, Conn., consulting firm.

VoiceStream is in the process of acquiring OmniPoint Communications, another GSM wireless service provider, which could provide SBC with GSM coverage throughout the Midwest and in key markets such as New York and Seattle, Egan says. The company would presumably get rid of its non-GSM holdings. ◪

XML has busy week

BY ELLEN MESSMER

By announcing this week that it will use XML to simplify the exchange of documents with its trading partners, Dell will become one of the first big companies to put the new technology to the test.

But in spite of this vote of confidence, XML still has plenty to prove. In fact, RosettaNet, the high-tech industry group defining more than 100 common XML-based business forms and processes for use by its members, last week acknowledged it has essentially scrapped a year's worth of work and is redoing the forms and processes.

XML is a standard for programming metatags in electronic documents so computers can convert content into any number of formats. The technology has begun to show up in a growing number of server products from big names, such as Microsoft, and relative unknowns, such as WebMethods and Extricity.

Dell has high hopes the technology will be a big improvement over traditional electronic data interchange for electronic commerce and other electronic business.

"XML will allow us to take the agnostic approach, whether our customer is using SAP, Ariba or EDI," says John Winfrey, Dell's e-commerce program manager.

Dell has installed WebMethods' XML-based B2B application server software, which can convert documents into XML and back.

If a trading partner doesn't have a way to send documents as XML, Dell will go to the partner's site and install WebMethods' B2B for Partners, a sealed-down version of the B2B product that can be used to send XML documents to Dell. The trading partner would need to pay about $15,000 for the software and training.

The high-tech industry is excited about XML. Dozens of electronics and semiconductor firms, including Intel, set up the RosettaNet consortium about two years ago to develop XML-based business forms and processes. The group has overseen interoperability testing — dubbed eConcert — between different vendors' XML-capable servers using the RosettaNet XML document definitions. Consortium members hope to have XML systems based on RosettaNet definitions in place by February.

Guy Abramo, a marketing executive at RosettaNet member Ingram-Micro, last week called the RosettaNet standards a critical factor in the distributor's effort to compete with competitors selling products via the Web. He also says XML technology is less expensive than EDI technology.

But last week, RosettaNet members said the consortium is ditching Version 1.0 of its XML document types and processes. Version 1.0 involved wrapping EDI code in XML wrappers.

"It was a shortcut, but not necessarily where we want to be," explains Phillip Merrick, WebMethods' president and CEO.

RosettaNet is now working on what it calls XML Schemas, pure XML document types that are dense with metatags, which can perform tasks such as ensure that a document has been fully filled in. RosettaNet members and observers say the technical disruption should not prevent the group from reaching its February goal. ◪

XML efforts

Different ways to put XML to work in e-commerce:

cXML. Commerce XML is a set of document type definitions (DTD) developed by Ariba for purchase orders and other documents.

BizTalk. Document types and procedures under development by Microsoft, with voluntary submissions from vendors posted at www.biztalk.org.

RosettaNet. A set of more than 100 DTDs and business process interactions under development by the high-tech industry.

Adding storage can mean a few late nights.

HP just made it a day job.

Wouldn't it be great if you could offer your customers safe, secure disk storage that was simple and quick to install? HP has the solution: The HP SureStore HD Server 4000. This breakthrough Network Attached Storage (NAS) device allows customers to add safe, secure disk storage directly to a Windows NT® network in just minutes—any time, any day.

For a limited time, we're offering qualified HP resellers the opportunity to purchase an HP SureStore HD Server 4000 demo unit at a 55% discount off list price. See for yourself how easy it is to install and use. Once you do, you'll want to share this breakthrough in network storage with your customers. And you'll discover that HP's Network Attached Storage Solutions are just as easy to sell as they are to install and use.

The quickest and easiest way to add storage to your network.

To qualify for your demo unit and get complete information on HP's Network Attached Storage solutions, visit:
http://hpstoragesolutions.com/NASDemo/

HEWLETT® PACKARD
Expanding Possibilities

ClickNet develops hacker detection product

BY ELLEN MESSMER

SAN JOSE — Desktop management vendor ClickNet Software is jumping into the security field with a product called Entercept that detects and prevents hacker attempts on servers and PCs.

Entercept seeks to prevent hacker activity through host-based server and desktop "agent" software that observes each request made to the operating system and checks to see if it's legitimate by comparing it to a list of known "attack signatures." The NT-based Entercept console can institute a security policy for up to 1,000 of these software agents and generate alerts if trouble is detected.

ClickNet didn't develop the Entercept product but rather bought it by acquiring Israeli-based start-up Corekt earlier this year for an undisclosed price, acknowledges Christopher Tomlinson, ClickNet's vice president of marketing.

"Corekt was still in the research phase, and their 15 security experts join our staff," Tomlinson says. ClickNet will continue marketing its traditional desktop management software, but the firm wants to remake itself into a security firm, he adds. The reason? "The growth in the security market," says Tomlinson, citing an International Data Corp. report predicting that the $2 billion market will triple in three years.

Can a 5-year-old privately held firm such as ClickNet, without known security expertise, convince the corporate world to give it a chance? Aberdeen Group analyst Eric Hemmendinger is ready to give the firm the benefit of the doubt. "A company that has a history already and knows how to run a business probably has a leg up on a start-up that's unknown," he says.

The Entercept product will be formally unveiled in mid-November. A few companies, including EMC, say they are preparing to beta test it.

Entercept will ship with NT and Solaris agent software that can evaluate every incoming request for system resources, such as opening a file, read-write, or a request to access a device. The user names and privileges are defined by the NT domain controller in the NT-based Entercept console, says Oace Dada, senior product manager for security at ClickNet.

At present, Entercept knows about 300 types of attacks, such as buffer overflows and Trojan horses like BackOrifice. As new attacks are identified, the Entercept console can download them in encrypted fashion from the clicknet.com Web site. The agent software can communicate with the Entercept console every 30 seconds as a default setting to get the attack signature updates. If the agent software on the server sees an attack, it can terminate the session, log it or send an alert.

The Entercept console will cost $5,000, with server agents costing $1,000 and desktop agents $95 each.

ClickNet: www.clicknet.com

VLANs,
continued from page 1

46% of IT organizations plan to implement VLANs by November 2000. The number jumps to 60% for companies with more than 1,000 employees.

"[IEEE] 802.1Q definitely helped spur this growth," says Mike McConnell, director of LANs and network management at San Jose-based Infonetics. "We used to see a 'two-years-out' mentality, but end users are deploying now that the technology is maturing."

IEEE 802.1Q is even taking some of the steam out of ATM in the campus, according to Mike Myriek, manager of technology services at the University of Mississippi. One of ATM's strengths is support for VLANs, but now Ethernet easily fulfills that function.

IEEE 802.1Q specifies how VLANs can be created by grouping switch ports into virtual LANs, but vendors have also enabled customers to create VLANs based on the protocol — such as IP or IPX — being carried.

The problem is, protocol-based VLAN support is particular to each vendor. The IEEE is now trying to standardize the approach in an effort dubbed 802.1v. The 802.1v work has just begun, but the group hopes to make substantial progress by the middle of next year, says Andrew Smith, software architect at Extreme Networks and project editor of 802.1v.

Lockheed Martin uses proprietary protocol-based VLANs, mainly to send DECnet and IP traffic through the same switch port, while keeping the DECnet traffic logically separate, says Joe Anderson, lead member of the engineering staff. "DECnet is very broadcast-intensive," Anderson says. "Everybody on the IP subnet doesn't want to hear the DECnet traffic."

Because 802.1v is still in its infancy, protocol-based VLANs are still proprietary, but 802.1Q provides a way for the VLANs to connect. Lockheed Martin is using 802.1Q to create a trunk between proprietary VLANs supported by its Xylan and Hewlett-Packard switches.

Another extension under consideration is making spanning tree sensitive to VLANs, Extreme's Smith says. A project called 802.1s provides for a scenario in which a user could have two redundant paths, or spanning trees, through a network, each supporting several VLANs and using as much bandwidth as needed.

If one path failed, 802.1s would make it possible to easily shift all those VLANs to the surviving path. Smith says the technical details are complete, and 802.1s is undergoing a working-group ballot right now.

On the management side, the IETF in August published a proposed standard that spells out how management software can set up and manage VLANs on different vendors' equipment. Cabletron's Spectrum business unit, which focuses on network management, is championing RFC 2674.

But at this point, Cabletron is the only major vendor supporting the proposed standard in its switches. 3Com says it will support RFC 2674 in its CoreBuilder switches next year.

Extreme, even though it co-authored the document, wouldn't say when it will offer support. Nortel Networks says it is waiting for user demand for the support. And Cisco says it will wait until after the RFC reaches draft standard status, which is expected to happen next year. ◪

Mixed bag

There are pros and cons to VLAN technology, according to current users.

The case for VLANs:

- Make it easy to add, move and change users.
- Organize users by priority or protocol.
- Limit broadcast traffic.

The case against VLANs:

- Can eat up backbone bandwidth.
- Often make spanning tree impractical.
- Are often unnecessary.

The Scoop

The news behind the news

THE DEBATE OVER VLANS

Virtual LAN technology has gone through a transformation over the past few years, and the industry remains split over whether the technology is really necessary.

A VLAN acts like an ordinary LAN, but connected devices don't have to be physically connected to the same segment. Even though clients and servers may be located anywhere on an interconnected network, they are grouped together in a VLAN, and broadcasts are transmitted to all the endstations within the VLAN.

VLAN technology endured the media cycle that all hot technologies go through. There was a period of hype followed by the inevitable backlash. Now, some believe, the technology is ready for implementation.

But there are still some who have reservations. VLANs were created to get around slow routers, and they are, therefore, a solution to a problem that no longer exists, says Dave Passmore, research director at NetReference. Putting two endstations on the same VLAN means you don't have to route between them, even if they are on different physical LANs.

In an age of processor-based routers, it made sense to avoid routing. But with today's Layer 3 switches, which route at wire-speed, this requirement goes away, Passmore says. VLANs, the argument goes, are just adding an unnecessary layer of complexity.

Others argue that VLANs are useful because they limit broadcasts on large, flat switched networks. Plus, the ability to add, move and change users on a network purely through software is still a benefit of the technology, says Patrick Kelly, director of product management at Cabletron.

VLANs also become important as users start to assign prioritization to different types of traffic. End users grouped in the same VLAN can be assigned the same priority.

Even Passmore acknowledges that there are some instances in which users may want to keep traffic separated through VLANs. For example, an application service provider, which supports multiple customers on the same gear, may want to keep them logically separate in this way.

— Jeff Caruso

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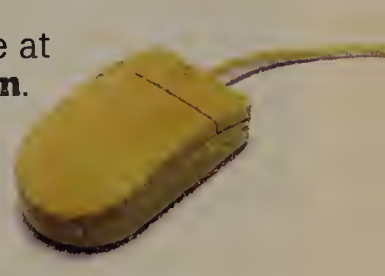


Network Inspector now works with Visio.

Wiretap,
continued from page 1

over the 'Net.

Network managers say any hole built into the Internet for legitimate law enforcement purposes would be abused by hackers, and the existence of such a hole could undermine consumer confidence in the Internet and slow the growth of electronic commerce.

"This proposal would be a big worry," says Chris Kozlov, network administrator for Arlington Industries, a Libertyville, Ill.-based distributor of imaging supplies that accepts online purchases via credit card. "Security is very important to our business because it's extremely important to our customers.... If you're putting in a back door to the Internet, somebody is going to eventually find it that isn't in law enforcement."

"I don't want it to be easier for someone to hack into my system. I want it to be difficult," says Dwight Gibbs, chief technical fool at The Motley Fool, an Alexandria, Va.-based Web site that features investment advice. "We give all of our information away for free . . . but we do have some stuff we would like to keep private."

The issue of whether a wiretapping capability should be built into the Internet promises to be the hottest topic at the next Internet Engineering Task Force (IETF) meeting, which will be held in Washington, D.C. in November.

Since the issue was put on the meeting agenda several days ago, e-mails have been flying between IETF members, many of who oppose the idea.

Work sparks debate

The wiretapping debate emerged from the IETF's work on protocols to support combined voice and data switches to carriers unless the switches support wiretapping. The members want to build wiretap support into a gateway protocol that converts voice traffic into Internet data packets.

The IETF's leadership decided to put the issue before the entire organization to determine if there is a consensus.

IETF Chair Fred Baker says the wiretap proposal would affect more than voice communications over the Internet.

"If I can tap voice communications, I can tap anything," he says. "I can tap keystrokes. I can tap files that are downloaded. The capability would wind up being used for all sorts of interceptions."

Baker is against the proposal.

"I don't think it's necessary to have anything in the protocols to support wiretapping," he says, adding that network sniffing equipment works fine. "All it would take [to intercept voice-over-IP conversations] is to open up a tunnel to the router . . . and then put in some kind of filter [like a sniffer] to see the traffic and fire a copy of it down this tunnel to somewhere else."

Also opposed to the idea is Keith Moore, director of the IETF's applications area. Moore argues that the IETF is an international organization and shouldn't be concerned about wiretapping laws in particular countries.

"The IETF has traditionally insisted on good security in its protocols despite the insistence by some in government and law enforcement that they need to be able to eavesdrop on network communications," he says.

Helping the feds?

Regardless of how the IETF votes on this proposal, network managers who employ encryption may end up supporting wiretaps of Internet traffic more frequently. When communications are encrypted over the 'Net, carriers can't intercept them, so the burden of supporting wiretaps is on the organization that is sending or receiving the information.

"Today, corporate network managers are not required by federal statute to help support wiretapping," says Scott Bradner, director of the IETF's transport area and initiator of the wiretapping debate. Bradner predicts that in the future, when voice, data and video are all sent over the Internet, network managers "may be asked by the legal powers that be to provide unencrypted data."

Liability concerns

The issue of liability for wiretapping may influence the type of encryption that corporate network managers buy. If encryption occurs at the desktop, the network manager can't intercept the communication. But if encryption occurs at a device on the edge of the network, the network manager can intercept the communication on its way to the desktop.

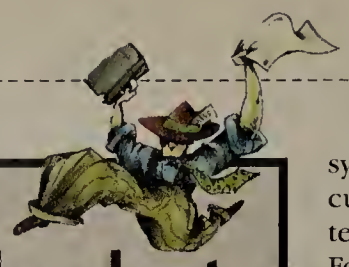
"If I could encrypt everything that came in and out of the company, I would," Arlington Industries' Kozlov says.

The company already encrypts employee e-mail, as well as purchase orders that come in over the 'Net.

"The whole idea behind encryption is to prevent people from looking at information. What would be the point if wiretapping were built into the Internet?" he asks.

Another concern for network managers is that the cost of combined voice and data equipment is likely to rise if wiretapping capabilities are built in.

"It doesn't seem reasonable to require everyone to build wiretapping into their equipment, which is going to increase costs," Moore says. ◪



The Upshot

The issue of whether wiretapping capabilities should be built into the Internet will heat up at the November IETF meeting in Washington, D.C.

Regardless of what the IETF decides, corporate network managers could find themselves in the position of having to help the feds with wiretaps.

Another concern is that the cost of converged network gear could rise as a result of wiretapping capabilities being built in.

"If I can tap voice communications, I can tap anything . . . The capability would wind up being used for all sorts of interceptions."

Fred Baker, chair, IETF

IBM,
continued from page 6

However, the external server will still be manageable with AS/400 tools, and will have greater reliability than typical NT servers because it will depend in part on the AS/400's more advanced architecture.

Several advantages

Among the advantages of the integrated external server is that it will have native AS/400 features, such as disk mirroring and backup and activities management.

The external server will also be manageable with Tivoli's IT Director.

There will also be a range of Netfinity applications that can be run on the external server, such as one that controls faxing.

Previously, NT card users had to rely on the AS/400's faxing tool, Scharf says. In addition, IBM is looking at ways to cluster the external NT servers for greater scalability and failover.

Users can also write custom code to tie together Windows NT and AS/400 applications. For instance, a Microsoft Exchange program could be tweaked to share data with a custom-written AS/400 business application, Scharf says.

That ability particularly appeals to LDG's Cornell. He says the stand-alone server could hypothetically be used to house his company's DB2 data warehousing application and could be tied together on the application level with the AS/400.

This would permit high-speed connections between the two operating systems without having to go through the network, he says.

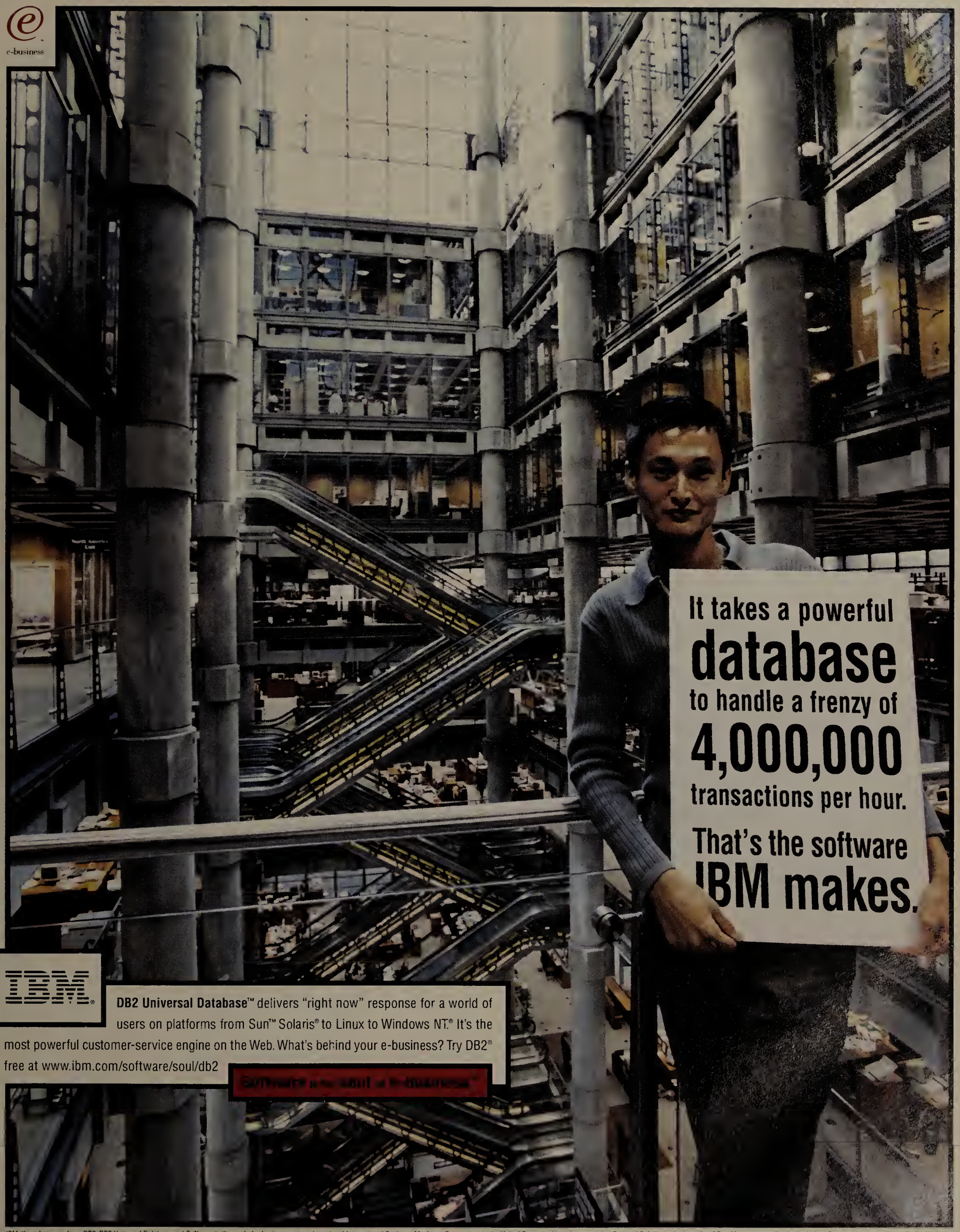
The upgraded Integrated Netfinity Server card will be available early next year. The connector card and external server will be available sometime in the second half of 2000.

Pricing has yet to be determined. ◪

telephony over the Internet. A wiretapping capability is built into central office telephone switches, and various countries, including the U.S., require carriers to intercept or report on communications at the request of government agencies. At issue is whether these requirements will apply to voice communications over the Internet.

There is no specific proposal coming from the U.S. government requiring carriers to support wiretapping over the Internet. However, there is an existing law — the Communications Assistance for Law Enforcement Act of 1994 (CALEA) — that requires carriers to have wiretapping capabilities built into the phone system and fines them $10,000 per day if they don't comply. Carriers are afraid that CALEA will apply to voice over IP.

Several IETF members who work for companies that manufacture telephone switches fear they won't be able to sell



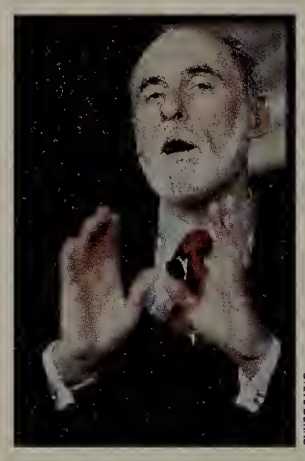
Internet pioneer: IPv6 transition needed

NetworkWorld Q&A

The Internet engineering community is promoting a new version of the Internet Protocol — Version 6 — as the answer to the address shortage predicted for the current Version 4. IPv6 offers enough addresses that every computer, cell phone and set-top box can be hooked up to the 'Net. However, migrating a large network to IPv6 is so difficult that few organizations have committed to it. In an interview with Network World *Executive Editor Doug Barney and Senior Editor Carolyn Duffy Marsan, Internet pioneer Vint Cerf argues that network managers need to start making the transition to IPv6 immediately.*

Why is IPv6 the right direction for the Internet?

The Internet is growing very, very quickly, and we are very concerned about running out of address space in the Version 4 network, which has a 32-bit address field. Theoretically, Version 4 could support up to 4.2 billion devices, but the allocation of those addresses has not been very efficient. We tried to increase the efficiency with interdomain routing and allocation rules that go along with it. But the side effect of those rules is the proliferation of network address translation [NAT] boxes, which take a single Internet address and multiplex it among a bunch of different devices. It's a fairly ugly process from an architectural point of view, although it turns out to be very effective, and a lot of people are relying on it. But because NAT intervenes at the IP address level, it has some consequences for end-to-end security and integrity of the traffic. Many of us would just as soon solve the problem of address space by having a much larger address space to draw upon, and that's what IPv6 is all about. It has a 128-bit address field, and that allows for 10 to the 38th power possible addressable devices. We should be moving toward IPv6 promptly, and we need to start now because the transition is fairly complex.



STEVE BORNS

Many people in the Internet community — including well-respected engineers and analysts — think that IPv6 is not a practical solution. What chances do you give IPv6 for succeeding?

It may very well be that the only way to get to Version 6 is for NAT boxes to convert Version 6 addresses to Version 4 addresses and back [for a while]. NAT boxes are turning out to be the path by which we get to Version 6. I challenge those who think we don't need to [move to Version 6] to come up with an alternative strategy that's achievable in the next several years.

What will it take for IPv6 to succeed?

All of the vendors of software in the edge devices have to believe that we need to [migrate to Version 6] and have to support it. One of the most prominent is Microsoft because of the huge number of devices that use Microsoft software to interact with the Internet.

All the router vendors have to pay attention to Version 6 so we can build a Version 6 core. Another set of players is the ISPs. A state of denial exists among some ISPs, who would just as soon not face this problem. Version 6 is workable, even if we have to make use of NAT devices in order to accommodate the mixture of Version 4 and Version 6 for a period of time in the network.

What if IPv6 fails to catch on?

We're still confronted with the problem of running out of Version 4 address space. What happens if there are so many NAT boxes that you can't uniquely identify them all with Version 4 addresses? Then we're back in the soup again. This is not a problem you can ignore.

If IPv6 is the right move, why don't users want it?

Most people who are doing applications haven't the foggiest idea of what the IP address space looks like and whether there's a risk of Version 4 vs. Version 6. If anybody should be paying attention to this, it's the ISPs. Most of them are betting the farm on NAT boxes in the near term.

What are the global ramifications of not adopting IPv6?

We can see the demand for hundreds of millions of devices on the 'Net already. Cell phones that are Internet-enabled. Cable set-top boxes and other appliances that become Internet-enabled. The people who are building [these devices] are getting IPv6 allocations. If we don't use IPv6, we'll have to use something else that gives us large address space. It took us quite a while to get to IPv6. There were a lot of debates, a lot of discussions.

The end result is a pretty strong design. So if we don't adopt it, we will wind up having to do yet another cycle of design and agreement. As we do that, the lifetime of the IPv4 address space is getting shorter and shorter. That's what I mean by being back in the soup. ◪

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Novell,
continued from page 1

Navy, who is currently piloting NDS for NT. "I don't want to upgrade to Active Directory now and then upgrade to redirect [at a later date]." Cruikshank says redirect provides a single directory service and that consolidation means less management. "If I had already deployed, this would be a bigger issue. I would have to ask myself, 'Where do I go now?' "

Faced with that question, IT executives may be inclined to choose one or the other NOS for their enterprise, according to analysts.

"The lack of redirect puts pressure on NDS customers to choose between Novell and Microsoft," says Daniel Blum, an analyst with The Burton Group in Midvale, Utah. "Customers can't continue to run both directories in parallel quite as easily as they once could. The value proposition of NDS is reduced."

Novell seems to be in a better position to satisfy customers right now because Active Directory is not shipping and will be nothing short of challenging to deploy when it does. Still, the issue of redirect has users concerned.

"This is a step back for me. My understanding was that they would offer redirect," says one network architect for a large telecommunications company, who asked not to be named. "The best feature of NDS for NT is keeping passwords in synch. They need to recreate that with DirXML."

Novell says it will do that. "The push is to manage user objects from both directories as one object," says Cydni Tetro, product manager for NDS.

> ***"The lack of redirect puts pressure on NDS customers to choose between Novell and Microsoft."***
>
> Daniel Blum, analyst, The Burton Group

The mothballing of redirect is somewhat of an about-face for Novell, which had promised the technology would be there for Active Directory. Two weeks ago at the Gartner Group symposium, Novell CEO Eric Schmidt began selling the change, saying the mechanics of how NDS and Active Directory synchronize will vary from NT 4.0 to Windows 2000 but "from the customer perspective, the functionality is the same."

While some experts dispute Schmidt's assessment, customers committed to redirect may be on a dead end. Two weeks ago, Novell officials admitted that Active Directory redirection is difficult because an entire subsystem has to be replaced.

Some observers go further, saying that redirection is impossible. But Drew Major, Novell's chief scientist, last week downplayed the difficulty, saying the technology will be developed over the long term.

But Novell appears to be hedging its bet that users will eventually accept synchronization, the same technology Microsoft is developing, over redirection.

"Novell doesn't want to do more work than they have to," says Laura DiDio, an analyst with Giga Information Group in Cambridge, Mass. In addition, synchronization is Novell's strategy as it pushes NDS into the electronic commerce market.

DiDio says both vendors know users don't want to run two NOS directory services for the same reasons they did not want to run both IP and IPX protocol stacks.

While synchronization is not a bad alternative to redirect, it can mean as much as a 60% increase in administration for NetWare shops running NDS for NT, according to experts.

Putting redirect on the back burner is not entirely Novell's doing. Microsoft tried to make redirection impossible when developing Active Directory, according to observers. When coupled with Novell's decision to shelve redirect, it pushes users into a fog of choices.

IT executives can install NDS 8, and upgrade to NDS 8 for NT and deploy the 1.0 release of DirXML, both of which ship early next year. Novell will release migration and upgrade tools for DirXML, a set of directory connectors. The upgrade also requires NetWare 5.0 and a new client.

Users could also uninstall NDS for NT, migrate off NetWare, and adopt Windows 2000 Active Directory. They could run NDS and synchronize it with Active Directory or vice versa.

IT executives also could opt to run NDS natively on multiple platforms. Versions of NDS 8 for NT, Linux and Solaris are expected to ship in 60 days. And a version for Windows 2000 is under development, according to Paul Corriveau, product marketing manager for NDS.

Users also have the option of running NetVision's Synchronicity, which provides a single point of user administration through NetWare Administrator, the management console for NDS. Novell itself bought into that option when it licensed Synchronicity in September.

"We went with Synchronicity because we are looking to migrate away from Novell, and if you can't redirect, you add administrative overhead," says Dana Arnett, network services manager for Asante Health Systems in Medford, Ore.

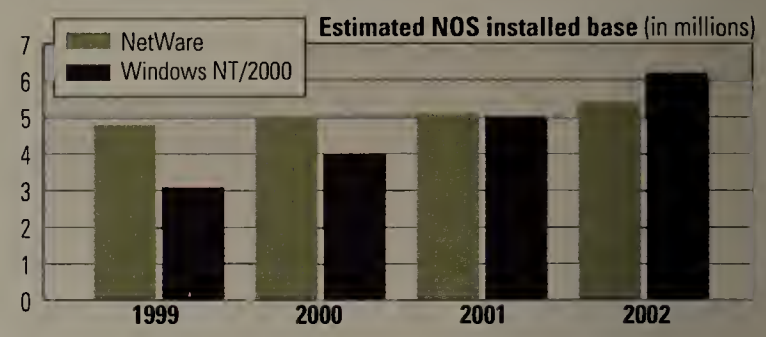
"Novell saw the failure of redirect coming," says Todd Lawson, president of NetVision. "That's one of the reasons they licensed Synchronicity, it was their trump card."

With the trump card down, users will have to decide which direction to pursue.

"If I had a mixed environment, I would wait and see the effort it takes to deploy Active Directory and then see if Active Directory or NDS is best for my environment," says Giga's DiDio. "Without redirect, users will have to choose." ◪

Choosing a network operating system

Novell's admission that it will not immediately provide a key directory integration tool for its Novell Directory Services may force users to make an either/or choice between NetWare and Microsoft's forthcoming Windows 2000.



SOURCE: IDC, FRAMINGHAM, MASS.

FOURTH EXEC LEAVES NOVELL

A fourth departure from executive management at Novell has customers and industry analysts questioning whether the company's recent turnaround is built upon a strong enough foundation.

The latest to leave, Vice President of Marketing Patti Dock, had her position "eliminated because of a realignment in Novell's marketing," says Jonathan Cohen, a company spokesman. Only on the job six months, Dock's exit was preceded by those of previous marketing head John Slitz and senior vice president for strategy Chris Stone, both of whom were brought into Novell two years ago by CEO Eric Schmidt and shared credit for the company's better performance. Glen Ricart, chief technology officer at Novell, also left in June.

The departures have not gone unnoticed.

Bob Markham, senior network architect with the American Red Cross in Washington, isn't surprised in light of the way Novell handled recent product introductions. Novell missed opportunities in the Internet before the arrival of Eric Schmidt, Markham says, and the company's failure "to establish Novell Directory Services over the Lightweight Directory Access Protocol" has lowered his confidence in the company's direction.

Novell's marketing woes have also worried Georgetown University.

"We've talked to Novell over the years about having a strategy and plan," says Ron Nicholson, a product manager. "The university is concerned about Novell's future and is presently evaluating a more unified system for e-mail." Georgetown has 12,000 GroupWise users.

Nicholson believes Novell is trying to address its marketing problems and hopes the com-pany continues to talk to IT executives about the business benefits of technology, rather than focus on technical network specialists.

One industry expert agrees.

Dan Kuznetsky, an analyst with International Data Corp. says the people responsible for focusing the company on the business values of products rather than their technological value have left. "Novell has to continue talking about the business rationale, how much money a company could save or make," says Kuznetsky. "It concerns me that Novell will retreat back into speaking to technologists, rather than the IT executives it needs to reach."

Morale at Novell has taken "some temporary hits" over the departures, says Cohen, who also notes that morale in general has stabilized under Schmidt's leadership.

— Deni Connor

Clarification

A recent article (*NW*, Oct. 11, page 27) mischaracterized Alcatel's plans for competing for enterprise business. Alcatel's branch office strategy is part of an overall enterprise strategy that includes its core routing business.

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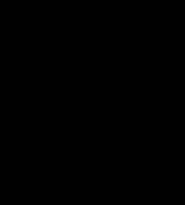

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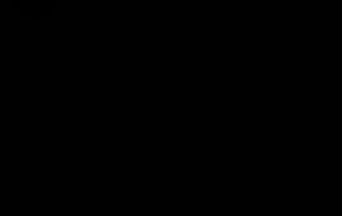

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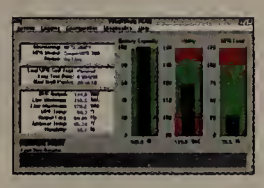

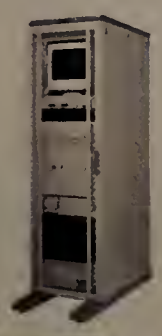

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Briefs

Computer Associates last week announced software and service support for IBM's OS/390 operating system and the new S/390 Multiprise 3000 server platform. The announcement includes a cooperative distribution and licensing effort targeted at helping companies doing business over the Internet. CA is also working with IBM on pretested Multiprise server software bundles to optimize database performance, improve management and handle Internet workloads. Also, as part of a new pricing plan for OS/390 software, CA will offer packages and products on a monthly lease for "as low as $6,000 per month."

CA: www.cai.com

IBM last week announced EverGreen/400, a software package for AS/400 midrange servers that lets 5250 users make e-mail connections to any standard e-mail server. With EverGreen/400, existing 5250 terminals can send and receive Internet e-mail messages, including Multi-purpose Internet Mail Extensions attachments. To support the product, the AS/400 server must be running OS/400 Version 3, Release 1 or later and IBM's AnyMail/400 and TCP/IP Connectivity Utilities. EverGreen/400 is available with pricing starting at $880.

IBM: www.ibm.com

Connex, a Western Digital company, announced its entry into the network-attached storage market with the Connex N3000 storage appliance. Designed for midsize business workgroups and remote offices, the product has a useable storage capacity of 90G bytes and connects to the network via a 10/100M bit/sec Ethernet interface. The Connex N3000 will be available in January for $6,000.

Connex: www.connex.com

IN-SITE: *Lessons from Leading Users*

Vacuum cleaner firm sucks up to VPNs

BY DOUG BARNEY

Patrick Prue had a simple reason for wanting to try out a virtual private network (VPN): He was just being selfish. The 26-year-old systems and technology specialist for Fantom Technologies in Welland, Ontario, wanted to do his work — managing systems — from home, making use of his snazzy high-speed cable modem.

Fortunately for Fantom, Prue's little experiment worked. The work was done over the Internet.

With those results in hand, Prue approached his superiors with a solid business case. Let workers for the Canadian vacuum cleaner maker take advantage of increasingly common high-speed connections to the 'Net — cable modems, digital subscriber line and the like — to get real work done at home. Oh, and by the way, we can save a heap on the 800 number dial-up remote access services folks were using to access the corporate LAN, Prue pointed out.

Fantom's Patrick Prue first tested out VPN technologies at home.

The initial goal was pretty straightforward. "What was being looked for was the simple ability to do anything we could do via dial-up but over the Internet," Prue explains. He points specifically to accessing the company's Microsoft Exchange e-mail servers and transferring files back and forth with Fantom's Windows NT servers.

With such compelling logic and his own experience behind him, Prue got the go-ahead. Now it was time to do the research. After poking around a bit, Prue decided to check out his existing firewall vendor, Secure Computing, which slid Fantom some new VPN gear to experiment with.

Prue basically liked what he saw,

See **In-Site**, page 24

Too many servers? Try a consolidation program

BY MARC SONGINI

IBM and other server vendors are only too happy to sell you as many servers as you'd like. But some of those same vendors would also be pleased to sell you a service that would ultimately reduce the number of servers in your shop, bringing down your hardware and management costs in the process.

For a variety of reasons, such as the growth of electronic commerce, some companies are forced to add more servers than they are equipped to handle. To remedy this thorny problem, new services and software tools offered by IBM, Compaq, Hewlett-Packard, Sun and others can help customers evaluate their server farms and find ways to reduce the number of servers.

But vendors in the server consolidation business have different approaches, and the user must select accordingly, warns Wayne Kernochan, an analyst with Aberdeen Group, a consultancy in Boston. For instance, Unisys is focusing on consolidating on Windows NT machines, while Sun is trying to replace NT servers with its Solaris boxes, he says. IBM, with its vast services organization, has the broadest approach.

Server "consolidation" may not be the right phrase — optimization might be closer to the mark, says Rich Fuchs, an executive in IBM's server consolidation program. Companies achieve a 10% to 15% reduction in overall IT costs annually with server reduction — including hardware depreciation costs, site costs, personnel and more, he says.

Incyte Pharmaceuticals' Philip Kwan was able to consolidate 50 to 60 Sun servers into just three.

JASON GROW

The company is quick to point out that larger users typically have a mix of servers, such as mainframes, AS/400s and NT machines, running a variety of applications. These users may not want to consolidate all their server applications on one platform, and they need someone who can assist them no matter what the application or brand of box they carry. IBM won't necessarily try to sell customers on its boxes.

To simplify things, IBM believes customers should concentrate first on lowering total cost of ownership, which can be achieved by simplifying the existing network, for example. Next, customers should look at improving service levels, thus ensuring continuous availability and improving server performance.

An additional burden for IT staffs is the need to get their applications up and running as fast as possible. In such cases, the network's server topology can actually be an extra layer of complexity that can hinder speed to market. Information location is another key area — the IT staff must learn how to find data in the network and get it to the right people at the right time, IBM says.

These things are not addressed just by adding new hardware — they also

See **Servers**, page 28

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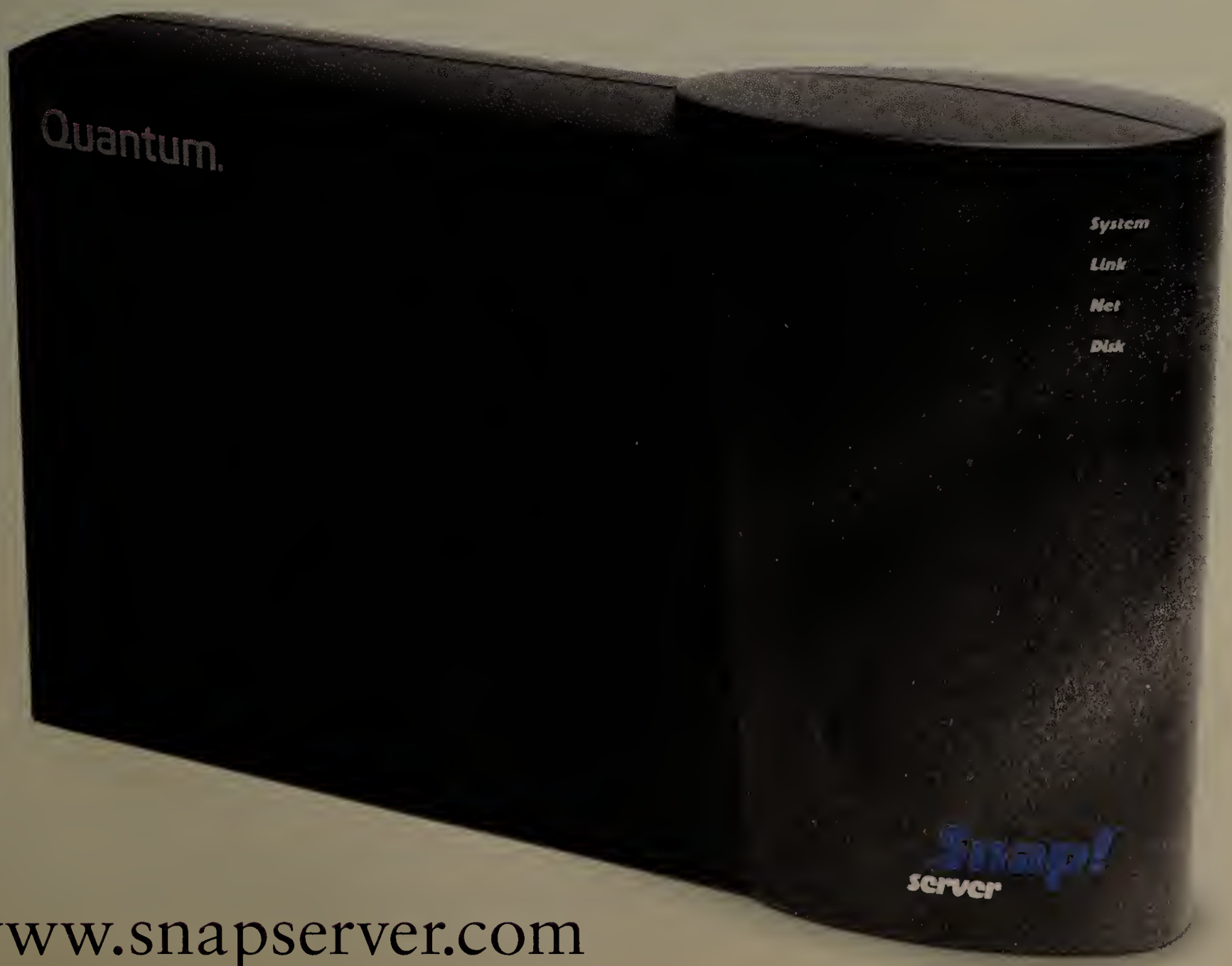

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Polycom targets high-end videoconferencing market

BY JASON MESERVE

SAN JOSE — Taking a page out of the Japanese car makers' playbook, Polycom is looking to offer customers high-end videoconferencing equipment for corporate boardrooms with the release of two new products.

Polycom is beefing up its product line with the new ViewStation FX and VS4000 systems to offer what it calls near-TV quality video and audio for large conference needs, such as boardroom and distance learning applications. Previously, Polycom has served the middle-market arena, selling sub-$10,000 conferencing systems for desktops and small conference rooms.

"Think of this strategy like Toyota introducing Lexus — it's luxury, but not as expensive and does everything and more [than the higher-priced competitors,]" says Jason Ader, research analyst at H.C. Wainwright & Co. in Boston.

The ViewStation FX includes a camera and video equipment.

With four times more processing power than its predecessors and the ability to transmit at over 1M bit/sec across T-1 connections, the new units should offer "superior video," says Andrew Davis, managing partner at Wainhouse Consulting Group in Brookline, Mass.

"We've been able to include more annexes to the H.263 standard for better motion handling and background cleanup," says Jennifer Sigmund, group marketing manager for Polycom's video division.

The units feature a four-port bridge that will host four participants at up to 384K byte speeds or three participants at 512K bytes and can stream conferences across the Internet in either Real G2 or Cisco IPTV formats. They also support H.323 (Internet), v.35 (ISDN) and primary rate interface (satellites, frame relay) calls within the same unit. Both new products can interface with room-based remote control units and interface with XGA high-resolution video projectors.

The ViewStation FX is a standard unit with built-in camera and audio equipment, while the VS4000 is a rack-mount system designed to fit in a closet and be used for custom videoconferencing systems. Both support the use of a second camera, dual microphones and remotes, as well as other inputs for mixing audio and data.

Both products will be available in Q1 of next year and are priced between $17,000 and $19,000.

While Polycom claims that this isn't a huge market area for them, it is an expansion of their existing product line that will allow their distributors (the company does not have direct sales) to sell from top to bottom in a company. "This announcement shows the company has its sights set on the whole pie, not just the slice they dominate," Davis says. "If anyone had reasons not to buy Polycom, those reasons have evaporated."

Polycom also announced recently that it signed a deal with Lucent, making it the exclusive provider of videoconferencing equipment to all Lucent's new customers. In 1998, Lucent sold some $20 million in PictureTel equipment, one of Polycom's biggest competitors, says Ader.

The deal also calls for the two companies to jointly develop products in the IP market, such integrating multipoint and other network capabilities into Lucent's next-generation PBX equipment. ◪

In-Site,
continued from page 21

especially the way the Secure offering worked with his existing SecureZone 2.0 firewall, which now serves as the basis of one of two different VPN approaches.

Just the basics

For people with fairly simple needs, Prue crafted a fairly simple solution. These employees simply tunnel through the firewall into the Fantom LAN using the Point-to-Point Tunneling Protocol (PPTP) that is built into Microsoft Proxy Server 2.0, a tool that is bundled with Microsoft BackOffice and also available separately.

Those who have lower-end machines and lower-end needs should not feel too slighted. With the home-grown PPTP package, users can access what they need. With the strong encryption, Prue knows their data is not likely to be compromised.

This strictly software-centric approach required no changes to the firewall, Prue says. For people with more rigorous requirements, Prue crafted a much higher-end system. These users are equipped with SecureClient software that, with the firewall's permission, gives them access to sensitive corporate data. The key to this approach is defining who can get to what. By using smart cards, the users can be positively identified. And the smart cards make the system that much more secure.

But not everyone is the same, or deserves the same access. Fortunately, the Secure Firewall lets Fantom managers define rules, based on each user's account, that dictate what network resources each person can access over the VPN.

Like many of today's VPN shops, Fantom is starting small. Only about five to eight people currently tap into the LAN this way. But the company has some big ideas, and hopes that this technology will eventually serve as the basis of an extranet that will give salespeople on the road, as well as business partners, customers and suppliers, secure and defined access to Fantom network resources.

Not all technologies truly change peoples' lives, but VPNs can and do. "VPN technology has allowed for a more blended lifestyle so you can spend time at home with the family but still be in touch with the corporate LAN within minutes compared to dial-up."

Ultimately, this approach could be liberating for employees and for the corporation, which can hang onto workers. "[VPNs] allow businesses to more effectively manage and employ telecommuters. I can easily see not having to leave home when the bandwidth totally allows us to do any kind of work," Prue says.

VPNs are new, which may be why they are not perfect. The Secure client has proven to be easy to use, if occasionally flaky. And the company is currently experiencing about 75% uptime with the system, which is actually good compared to its old remote access services approach, and acceptable for the type of casual use the system is currently experiencing. But this is not yet a system that Fantom would trust for mission-critical use.

In the near term, Fantom can look forward to more dial-up. "Based on routing all the dial-up traffic over to VPN use, we should start seeing cost reductions in the neighborhood of $750 to $1,050 monthly on the 800 circuit utilization," Prue says.

So what else might be on the agenda? One thing Prue is eyeing is offering access to SAP client software over the VPN.

"I definitely feel that VPN/extranet technologies will steer us toward more direct business-to-business communications and will eliminate some of the value-added networks that are currently used," Prue says.

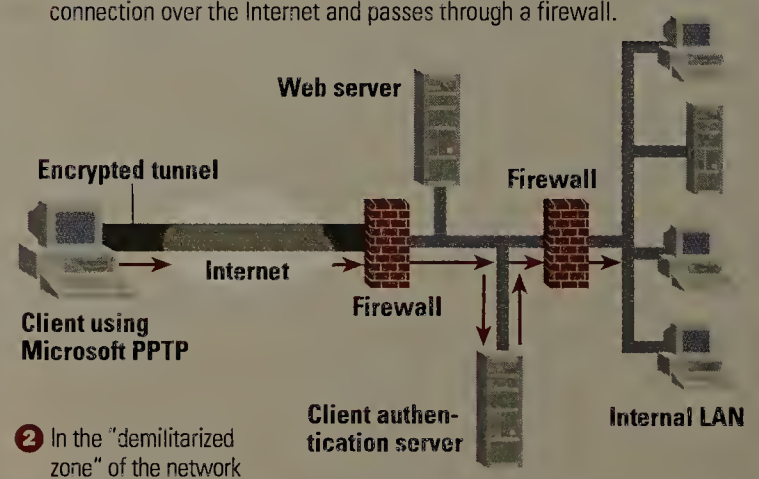
Prue has advice for those interested in following in his tracks. "Carefully assess your needs. Will a hardware solution better suit what you are trying to accomplish or will a software-only solution suffice?" Prue says.

Overall, end users are happy, and IS is generally pleased. "There have been a few bumps in the road as to getting the system tuned and operating correctly, but that's to be expected with any new technology."

That is just fine for Prue, who recalls, "I was one of those kids that liked to take things apart, and put them back together — with extra parts." ◪

Fantom's simple but effective VPN

Fantom took advantage of the VPN technology built into Microsoft Windows, then added a few bells and whistles.



These days, much of the talk surrounding Internet VPNs isn't much more than smoke. That's why hundreds of leading businesses are turning to UUNET® when they need reliable global VPN services that are a reality today. After all, UUsecure℠ VPN is a managed end-to-end VPN that's unmatched in the industry. As part of the MCI WorldCom℠ global fiber network, we can carry your critical data from local-to-global-to-local seamlessly. With UUNET, you don't just get access to the world's most rigorously engineered Internet network. You also get security features of a private network, at a fraction of the cost. So if you're tired of high-flyers with empty promises, call 1 800 258 9688 or visit www.info.uu.net/vpn. You'll quickly discover that only UUNET dares to guarantee network availability, performance and latency.* And that's no stunt.

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Servers,
continued from page 21

require looking at business processes. IBM uses a variety of tools, such as its Align model, to solve the optimization problems of networks. Align is a methodology IBM has created from its consulting experience. With the aid of user profiles, Align makes recommendations to achieve certain goals. In the future, IBM hopes to offer a Web version of the Align tool that users can access over a PC and that will help them evaluate their networks. From there, the user can go to an IBM business partner for further assistance, Fuchs says.

Once the general goals are established, IT professionals can get more specific about the technology involved. In implementing an optimization scheme, some things may have to stay the same while others change. If a company's primary goal was to save money, IBM would create a database of all of that company's network resources. Say the company had six entry-level RS/6000 servers running e-business applications, as well as a more powerful RS/6000 that was being underutilized. The company could consolidate the e-business applications on the more powerful server and save on the administration and hardware costs associated with the six smaller boxes. There's an infinite variety of ways to implement an optimization, IBM says.

Some other vendors have different approaches. Sun has a 9,000-member professional services branch able to execute a thorough consolidation program, but only on the Solaris platform, unlike IBM or Compaq, which will work with other vendors' gear. Sun first does assessment of the customer's hardware and software assets, generating a total cost of ownership figure along with an estimate of potential consolidation savings. From there, users can benefit from Sun's design and implementation skills, says Tom Bankert, a Sun executive.

Working with a vendor to do a server consolidation makes sense, particularly for small to midsize companies that may not have extensive in-house IT staffs, says Philip Kwan, a network manager at Incyte Pharmaceuticals in Palo Alto. Incyte, which has a large Solaris and Linux network with around 400 servers, executed a consolidation more than a year ago. The staff relied on advice from Sun, but the program was always under in-house control.

Kwan says Incyte started to shed its smaller Solaris boxes in favor larger ones and clustered together its Linux servers to improve scalability. The implementation allowed the network to consolidate 50 to 60 Sun servers on three larger boxes, reducing administration costs and increasing availability.

But users must remember that consolidation isn't just a technology issue, and is not measured only in dollars and cents, says Aberdeen's Kernochan. Sometimes users should look at how well a consolidation affects the applications on the business side. "You don't want to just stop at cost," he says. ◪

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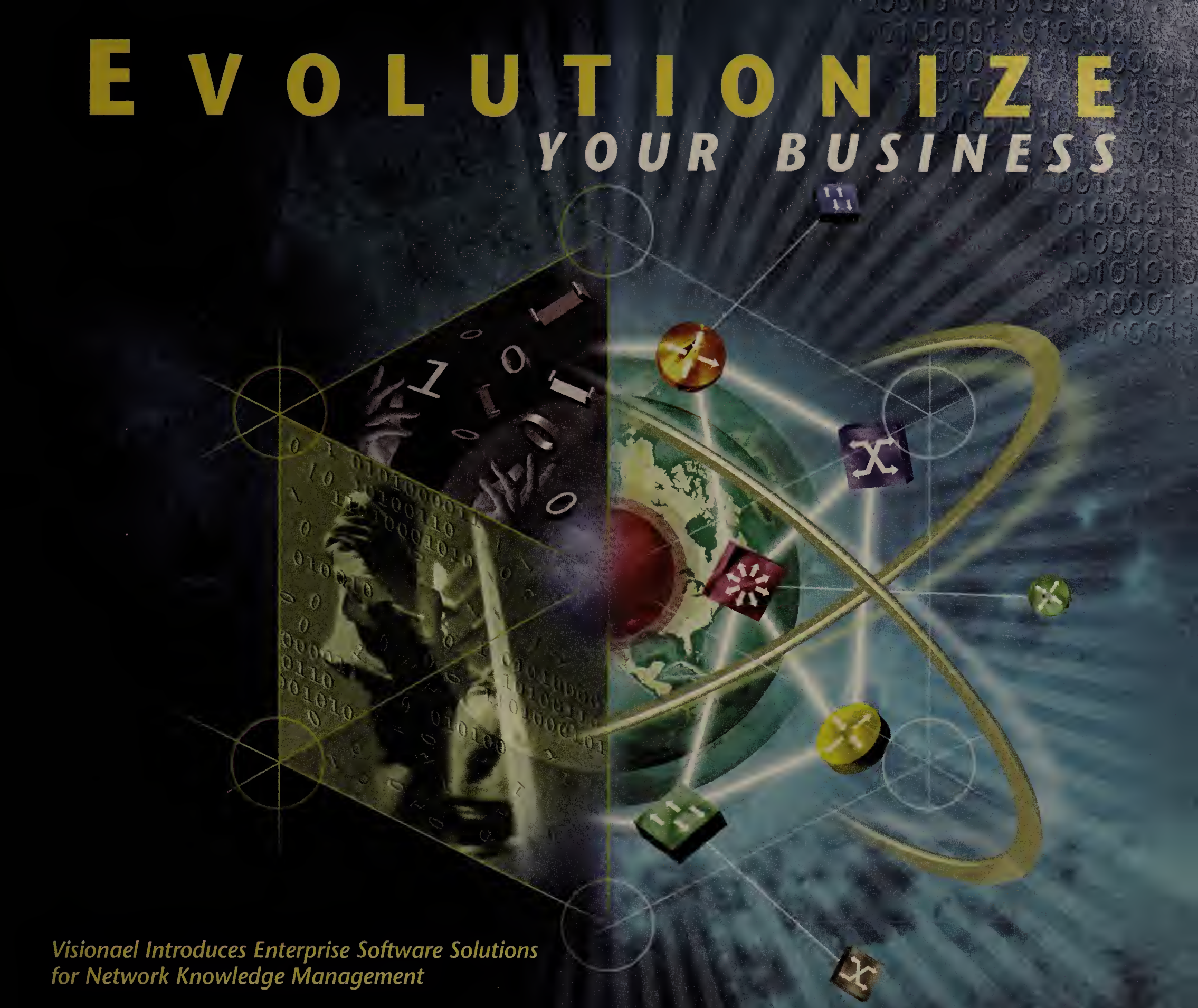

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Wired Windows . Dave Kearns

A TALE OF TWO VAULTS

It was the best of times. Fall, when here in the heart of Texas, the nights are cooler and the days are no longer 100-degree scorchers. Hockey season had started again, with better prospects for my hometown Austin IceBats. Life was good.

It must have seemed that way recently for Novell, also. Its DigitalMe initiative, solidly grounded in its Novell Directory Services (NDS) technology, was due to launch at Internet World in New York. The consumer press was paying attention, giving DigitalMe (www. digitalme. com) more play than the competing Passport (www.passport.com) initiative from Microsoft.

Passport was launched very quietly, surprisingly so for Microsoft. Novell launched DigitalMe amidst a full panoply of hoopla. What happened?

First, what are these products? Passport and DigitalMe purport to be consumer products, allowing consumers to store identity information securely — in a so-called data vault — so the information is available anywhere on the Web from any platform. Logon, credit card and shipping information are available at the click of a mouse button. For Passport, the target Web site just has to "Passport-enable" itself. Novell went further, claiming no changes were necessary at Web sites to allow DigitalMe to work.

If only it were that easy. The morning after the launch, DigitalMe was down for hours, supposedly for maintenance. After coming back up, users of Internet Explorer 5 couldn't access the Web site. The "mail to" link, to be used for feedback, worked only sporadically. The contact phone number listed on the site rang busy all day. A link to the support site (nntp: novell.digitalme) worked, but no one in the newsgroup was any better informed than the general public.

By the second day, the bug blocking Internet Explorer 5 was fixed, the mail server link was improved, and the phone company stopped blocking calls to the toll-free number. But the link to the newsgroup was gone. Of course, the link still didn't work at any of the Novell sites requiring authentication or form fill-in.

It was a marketing nightmare. Meanwhile, Passport — already accepted at more than 60 major consumer destinations on the Web — kept quietly working.

NDS is by far the best technology for a digital vault. It's available on many server and client platforms. NDS is a mature directory technology — just what commercial users of the Web need. It's too bad it was so poorly handled at launch.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at wired@vquill.com.

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Tip of The Week

Available now in bookstores is Peter Norton's *Complete Guide to Networking.* The book is a good overview of network technologies and systems, especially well-geared towards the newly certified CNEs/MCSEs to help broaden their knowledge of all that makes up an enterprise network. Peruse a copy at your favorite brick-and-mortar bookstore.

Carriers & ISPs

The Internet, Extranets, Interexchange and Local Carriers, Wireless, Regulatory Affairs

Briefs

Bell Atlantic is rolling out its Managed Frame Access Service, in which the carrier supplies and manages **Cisco** routers at customer sites. Customers pay nothing upfront for the routers. The service gives customers access to daily Web-based reports on availability, delay, congestion, lost packets and other factors network managers need to gauge to see if their frame relay networks are performing as they should.

The service costs $199 to $560 per month, per site.

Bell Atlantic: www.bellatlantic.com

Digital subscriber line service provider **Northpoint Communications** will provide DSL lines to **Pacific Bell Internet Services,** the first time a major regional carrier has hired someone else to deliver its DSL lines.

Northpoint will provision 144K bit/sec DSL access lines that PacBell Internet's customers will use to connect with PacBell Internet's points of presence. The lines rely on copper wires owned by PacBell Internet's parent company, SBC Communications. Until now, PacBell had been provisioning lines for its Internet division.

Integrated access device vendor **Premisys Communications** has stepped up the race to get competitive local exchange carriers (CLEC) to install and manage IADs at customer premises.

Premisys signed up big distributor **Phillips Communications and Equipment Co.** to market the Premisys line — which includes traditional time-division multiplexing as well as ATM aggregation devices — to new carriers. More than a dozen IAD vendors are trying to sign up CLECs to include their boxes in new managed offerings.

PSINet betting that bigger is better

BY DENISE PAPPALARDO

With jaws wide open, PSINet is biting off an Internet expansion plan that will either choke the company or help it thrive.

The Herndon, Va., ISP has announced plans to expand its network with physical and wireless infrastructure, build 20 new data centers around the world and offer business users an integrated global Internet access service.

"This is the culmination of PSINet's ongoing buying spree, and its move away from low-margin ISP business services," says Mark Zohar, senior analyst at Forrester Research, a consulting firm in Cambridge, Mass.

In the past 20 months, PSINet has acquired 50 ISPs from around the world to offer business users a global network footprint that's unmatched by the likes of UUNET or AT&T, says William Schrader, PSINet's CEO. PSINet last week marked its 50th ISP acquisition with the purchase of Zircon in Sydney, Australia. PSINet has been secretive about how much it has spent on these acquisitions, but Schrader puts the total figure at more than $1.7 billion in cash for all 50 buys.

While PSINet has been offering business users Web-hosting, electronic commerce and managed virtual private network (VPN) services for two to three years, Zohar points out that the ISP is better known as an Internet access provider for small to midsize customers. Schrader, who disagrees with that assessment of PSINet, has something different in mind for his company: becoming what he calls an "Internet super carrier."

Being an Internet super carrier means owning your own facilities and infrastructure around the world, Schrader explains. "Experience has taught us that joint ventures with dim-witted monopolies just don't work," he says, referring to incumbent local exchange carriers and companies such as AT&T, British Telecommunications or NTT. "To win in a global Internet business you need to be bold and strike out on your own or not at all," he says.

"Experience has taught us that joint ventures with dim-witted monopolies just don't work."

William Schrader, CEO, PSINet

Business users should look at PSINet's plans to offer e-commerce and Web-hosting services around the world as a positive move because it will offer them another choice, but Zohar still questions the long-term success of the plan. Besides dealing with network integration problems when interconnecting multiple networks with new dark fiber, PSINet will also be dealing with many cultural issues with each of its 50 international ISP acquisitions.

If PSINet can get through the integration and cultural hurdles, it is still faced with very large expenses. "PSINet is hemorrhaging due to huge quarterly losses," he says. PSINet reported net losses totaling $57.8 million last quarter and $58.7 million in the previous quarter.

Schrader says becoming an Internet super carrier is the only way to succeed in the long term, which speaks to his willingness to spend more than $1 billion on acquisitions. PSINet's network expansion plans include buying 16 dark fibers from IXC Communications. This is the company's largest dark fiber acquisition. PSINet plans to bring four fibers

See **PSINet**, page 34

Concert bringing out new managed IP service

BY DAVID ROHDE

The AT&T-backed international venture Concert has launched a service that almost — but not quite — amounts to a global IP virtual private network (VPN).

At the recent Telecom 99 show in Geneva, Concert introduced Concert Managed IP. The service provides VPN-like any-to-any capability to send IP traffic between any two enterprise network sites but without a public Internet component for outside users to log on to the network.

Concert Managed IP employs Cisco's implementation of Multi-protocol Label Switching in its core routers. That way, Concert can provide three service classes between any two network sites — the highest for latency sensitive traffic, the middle one for important data transmissions and the lowest one for store-and-forward applications — without requiring private lines or fast-packet-style pre-provisioned virtual circuits.

But unlike a full VPN implementation, there is no tunneling or encryption all the way to the user site or desktop. Instead, users have to purchase a dedicated frame relay user-to-network interface, says Alex Pinnell, European marketing manager for Concert IP services.

As a result, each site on the network must maintain a Concert-managed Cisco router. Public Internet gateways and additional VPN security capabilities for purely remote users will be added to the offer next spring, Pinnell says.

Service availability also falls into the "not quite" category. Concert is going through a transition from its original form — a joint venture between MCI and British Telecommunications, now wholly owned by BT — to a full-fledged stand-alone carrier half-owned by AT&T and BT each.

The "old" Concert continues to sell traditional voice, data and Internet access services. The "new" AT&T-backed Concert — which needs one more regulatory approval, from the Federal Communications Commission — will include VPN-like services like Managed IP but cannot start until the FCC gives the nod.

Concert officials declined to give price and service-level agreement details until Managed IP comes onto the market.

HarvardNet introduces DSL VPNs

BY TIM GREENE

BOSTON — HarvardNet is wheeling out RemoteConnect, a virtual private network (VPN) service for businesses in the Northeast.

Based on digital subscriber line (DSL) service, remote corporate sites can be linked at speeds ranging from 144K bit/sec to 1.5M bit/sec.

Remote sites will be equipped with Paradyne DSL gear and connect over a regular phone line to the HarvardNet network. The traffic will be switched via Cisco ATM switches to a corporate headquarters site over a T-1 or T-3 link.

For a 144K bit/sec connection, customers will pay $50 per month for a one-user site or $149 per site for multiple users. Installation costs $199 for a one-user site and $995 for multiple-user sites.

For sites that cannot be reached by DSL because of problems with the quality of phone lines, HarvardNet will make connections via frame relay circuits. A 56K bit/sec frame relay connection costs $219 per month

Plymouth Rock Assurance Co. is using a DSL VPN from HarvardNet to connect 120 remote sites run by independent insurance agents. Plymouth Rock is in the process of switching the agents over from a network of dumb terminals connected to the company's headquarters via 56K bit/sec frame relay connections, says Rich Wilkins, vice president of technology and chief information officer.

The VPN lets Plymouth eliminate the dumb terminals. Instead, agents use their PCs and browsers to access an Altiga tunnel server at corporate headquarters. Client software from Altiga creates an IP Security tunnel from the agent sites to headquarters.

The VPN service will cost Plymouth one-third of what the frame relay service costs, Wilkins says. That means Plymouth Rock can afford to let more agents contact company resources than before.

At 144K bit/sec, the VPN connections are more than twice as fast as frame relay connections. The traffic travels over the HarvardNet backbone and is delivered to Plymouth Rock headquarters in Boston over a T-1.

HarvardNet is planning on service-level agreements that will guarantee that network availability and delay stay within an acceptable range, the company says.

HarvardNet: www.harvardnet.com

PSINet,
continued from page 33

online by the end of 2000, which will equal nearly 14,000 route fiber miles. PSINet also announced it is deploying Nortel Networks' dense wave division multiplexing equipment to maximize the amount of traffic it can support.

In an unconventional move, PSINet is also acquiring an 11-node OC-48 SONET ring in Manhattan from an unnamed major carrier. This deal is subject to regulatory approval and will provide PSINet with direct, local access to most of Manhattan's business users.

Today, PSINet has two data centers in the U.S., but by the end of next year, the ISP expects to have 20 data centers in locations such as Brazil, Germany, Japan and Hong Kong. By the beginning of 2000, PSINet plans to offer a global Internet access service that will include one price regardless of where users are located. ◩

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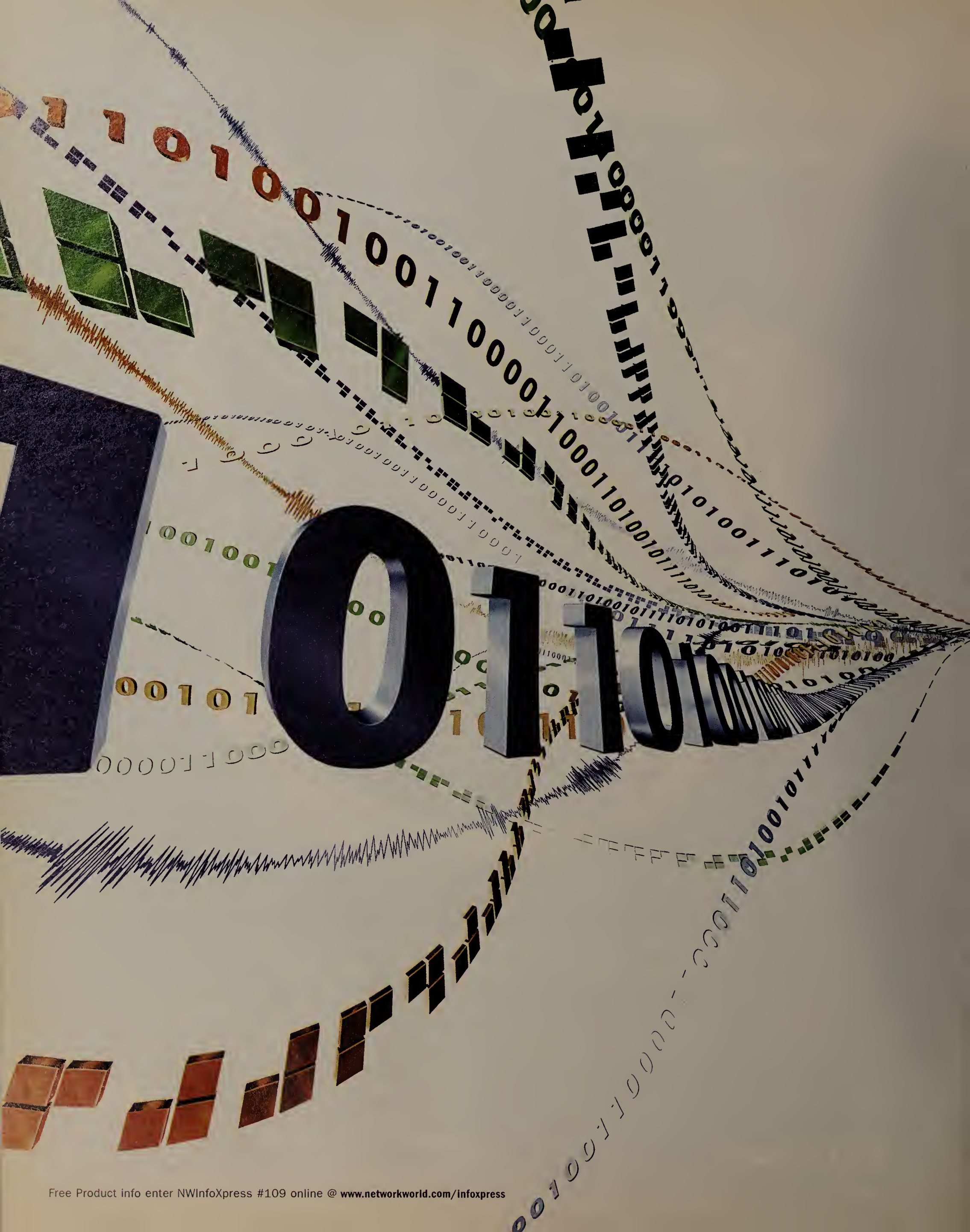

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Unisphere SOLUTIONS

Wan Monitor . Daniel Briere and Christine Heckart

IRIDIUM? GLOBAL ONE? WHAT DID YOU EXPECT?

We see dozens of new business plans each month and many ideas for solving problems. Most never see the light of day for a good reason: They stink.

Still, it amazes us when high-flying ideas get so much press and financial backing in this bull market — no one wants to be left off the next Yahoo, Red Hat or Cerent bandwagon. Each time, we ask ourselves, "Are we dumb? Are we missing something here?" Nine times out of 10 (OK, maybe eight), a few years later, we find that our initial instincts were solid.

Take the present status of Global One. A recent *Wall Street Journal* article called attention to the fractious state of the Deutsche Telekom and France Telecom relationship. Duh! Telecom managers who have dealt with both companies in the past could see this coming. In fact, when the Sprint, DT and FT announcement was made, it sounded like the start of some joke: "OK, you've got the CEOs of Deutsche Telekom, France Telecom and Sprint at the bottom of a well, and they're trying to decide how to get out. . . ."

Then there's Iridium. Anyone who has watched the intricacies of price competition in the long-distance market had to question the sanity of this one from the start. There simply is not enough demand for $3-per-minute calling, no matter where you are, to justify the business case. Ask the airlines that have been dropping voice call rates to drive usage.

Don't get us wrong — some people will pay for this, but will enough people sign up to sustain the company? Nope. What was the first warning sign? When Iridium had to reduce the number of satellites to 66, thereby blowing the whole point of naming the company after the element Iridium, which has 77 protons.

Is this 20/20 hindsight? No, it's common sense. Don't lose sight of common sense as your firm seeks to take advantage of the Internet, use new technologies to solve problems or enter new markets.

We tend to constantly second-guess ourselves as to whether other people are smarter when it comes to picking the winners in the marketplace. Well, we shouldn't. Our initial reactions are often correct.

Many of these newfangled services and products are bombs and will never go anywhere. Only one out of seven start-ups really makes it, and that's just counting those that are around long enough to have that assessment made, most venture capitalists say. When you throw in all the business plans and ideas that never got off the ground, the number is probably more like one in 50, at best.

So if something sounds stupid, say so! In a few years, you're likely to be right 49 out of 50 times.

Briere is president and Heckart is vice president of TeleChoice, a consultancy in Boston. They can be reached at dbriere@telechoice.com and checkart@telechoice.com.

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Cashing in on Internet caching services

BY CAROLYN DUFFY MARSAN

'NET CACHING SERVICES

Sandpiper, Akamai, Digital Island and the like speed Web content delivery.

The IT staff at CNBC.com had a problem. The performance of their Web site varied dramatically depending on where users were located around the globe. For some, the pages popped up instantly. For others, too many seconds would drag on before the financial headlines, photos, charts and stock ticker appeared.

Programming for such a diverse user experience was difficult.

Enter Sandpiper Networks, a Thousand Oaks, Calif., provider of Internet caching services. CNBC.com struck a deal with Sandpiper to send its graphics — which represent about 20% of the site's content — over Sandpiper's worldwide network of high-speed servers. CNBC.com serves up the rest of the content itself. After relaunching the site in June with Sandpiper's services, CNBC.com was able to standardize the experience of end users and serve more of them.

"More people get a good experience with the content we have," says Michael Whelan, who was vice president of technology for CNBC and now is a Teaneck, N.J.-based consultant. "Site traffic is growing very dramatically. Now we're going to look more deeply at the site architecture to see if there are other parts we could change to improve user performance . . . to see if we could use the Sandpiper services more effectively."

Sandpiper represents a new breed of companies offering Internet caching or content delivery services. These companies — which include Akamai, Digital Island and Mirror Image — improve the performance of Web sites by putting copies of the content in caching devices that are close to end users. The end users call up the local copy rather than pulling the information from the originating server located somewhere across the Internet. The services conduct constant monitoring to keep the local content up to date with the originating server.

Popularized during the last six months, these services are used by many of the largest Web sites to handle embedded objects in Web pages, such as company logos, ad banners and graphics. They work best for content that is served up regularly rather than dynamic content created on the fly for an end user. Another popular use is for the delivery of large files, such as software programs or manuals. These caching companies also plan to deliver streaming video and audio with new offerings announced in recent weeks.

Internet analysts say these companies are poised for significant growth. Internet caching services are "going to be one of the biggest growth markets on the 'Net for the next three years," predicts Al Lill, vice president and research director for Gartner Group. "It's a virtual no-brainer. [For customers,] the risks associated with these services are so low."

Overall, the worldwide Internet caching market, including service providers, is expected to grow from $269 million in 1999 to nearly $2.2 billion in 2003, according to Internet Research Group of Los Altos, Calif. Enterprise sales are expected to increase from $110 million to $1.4 billion.

One reason for the popularity of the services is that in addition to speeding the performance of Web sites, they also reduce bandwidth costs. This is especially true overseas. Similar to the telephone system, Internet caching services cut network costs by serving content locally rather than incurring a long-distance charge.

The services boost reliability by mirroring a Web site's content on distributed servers. Some of the services use multiple ISP networks, so they can route around slowdowns on the Internet. In addition, they work with customers' existing caching hardware and software products from vendors such as Inktomi and Cacheflow.

Migrating to one of the services is easy, users say. It takes only a few hours at most for a Web site developer to do the coding necessary to take advantage of caching services. And that time should be reduced as Web site development tools add features that allow developers to build caching into their applications.

Customers can roll out Internet caching services gradually, migrating graphics first and later adding other content. To help customers feel in control of their content, service providers offer real-time monitoring tools and historical analysis. The tools help customers track how many hits their Web site is getting each day, where the traffic is coming from and other trends that they would watch if they were managing all of their own content.

One concern Web site developers have about these services is security. Some customers want to apply cookies to content served remotely, while others want support for passwords and digital signatures to ensure that only certain people can view documents replicated around the world. Service providers offer different options when it comes to security.

Security was a major concern for Finjan Software of San Jose, which uses Digital Island's caching service to distribute its security software. Finjan's Web site supports more than 30 software downloads per day, with some as big as 50M bytes.

"We can't afford to be hacked," says Dave Kroll, director of corporate marketing. That's why Finjan tapped Digital Island's password protected service to distribute upgrades and provide customer service. Finjan also benefits from performance improvements by using the Digital Island service. "They've definitely pruned off seconds from the end users' experience," Kroll says.

Before Web site developers hand over their content to an outside vendor, CNBC.com's Whelan recommends signing an agreement that mandates a level of quality of service that is better than they can provide on their own. "We were very concerned about reliability, and we have that built into our service-level agreement," Whelan says. "They have to serve the right data and have to do a better job of serving that data than we could in terms of speed."

Although caching services are used mainly for Internet applications, analysts see great potential for the technology in intranets and extranets. "As new e-business applications roll out, as businesses upgrade to Office 2000, and as HTML traffic booms on corporate intranets and extranets over the next five years, we expect caching applications within enterprises to grow significantly," states a report from the Internet Research Group. ◩

Internet caching/content delivery services

A sampling of some companies that are delivering the new service:

Company	Akamai	Digital Island	Mirror Image	Sandpiper
Location	Cambridge, Mass.	San Francisco	Woburn, Mass.	Thousand Oaks, Calif.
Service	FreeFlow	Content Distribution Service	Central Cache Connection	Footprint
Founded	1998	1995	1998	1996
Network	1,200 servers, 40 networks, 24 countries	Servers N/A, 5 data centers, 21 countries	39 servers, 4 central cache sites, 3 countries	500+ servers, 30 networks, 15 countries
Customers	Yahoo!, CNN, J.Crew, Apple, InfoSeek	E-Trade, Bell & Howell, Payment.Net, Candle	BBC, SpringNet, JTM Multimedia, Rocket Networks	E!Online, LA Times, Intuit, CNBC.com
Web address	www.akamai.com	www.digitalisland.com	www.mirror-image.com	www.sandpiper.com

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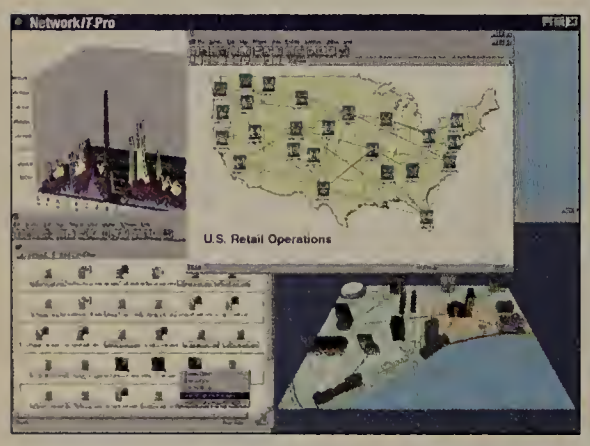
Discovery Wizard And Live Status	✓	
Distributed State Machine (DSM)	✓	
DSM Configuration Wizard	✓	
DNS Discovery	✓	
Event Management	✓	✓
Built-In Customizable Event Correlation	✓	
Frame Relay Option	✓	
Historical Trending	✓	✓
Layer 2 Network Connectivity	✓	
Network Management Policies	✓	
Performance Scope	✓	✓
Shared Calendar Objects	✓	
Switch Management Option	✓	



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Briefs

Concord Communications this week announced it will merge with **Empire Technologies,** combining Empire's system and application management tools with Concord's performance management software. The merger, valued at over $31 million, will allow Concord to combine real-time information about Windows NT and Unix servers with Concord's historical information. It will also provide Concord with a software agent that runs on those servers and takes corrective action when server problems crop up.

MessageWise is offering an Exchange 2000/Windows 2000 readiness program based on its InLook network auditing and configuration management tool.

The program provides a complete inventory of an enterprise's Exchange and NT servers, including software, version levels and configuration settings. The inventory includes information on Exchange directories such as connector settings and routing tables.

The service is available now, and pricing starts at $1,000.

MessageWise: www.messagewise. com

Covalent of Lincoln, Neb., is making it easier for network managers to run the open source Apache Web Server by offering several support options designed for large enterprises. Customers can choose from three levels of support: 24-7 phone and e-mail support costs $60,000 per year; business-hours support by phone and e-mail costs $30,000 per year; and e-mail support costs $1,000 for 12 incidents and $1,700 for 24 incidents. The software runs on four million machines.

Covalent is first to offer packaged support for Apache, says Randy Terbush, the company's chief technology officer.

Covalent: www.covalent.net

Obstacles remain for 'Net billing

But companies are confident that electronic bills will pay off once more customers embrace them.

BY ELLEN MESSMER

Consumers are increasingly willing to pay their monthly bills electronically over the Internet, eliminating the old excuse "the check is in the mail."

This should mean dramatically lower costs for the telephone, utility and other companies issuing monthly bills. Internet bills generally cost billers about 50 cents or less to process, whereas it typically costs at least twice that for traditional bill processing, which involves printing and postage charges.

But while consumer support for Internet billing is on the rise, billers still need a lot more customers to embrace the concept before the billers can break even on their Internet billing investments. Worse, there's no standard for getting billing information out of the biller's back-end system, usually a mainframe, in order to present it in full detail on the Web for payment.

That means the biller may take one technical approach to post a consumer's bill at its Web site, if the consumer wants to pay the bill there. But if a consumer wants to review and pay the bill at other points on the Web, say at a bank's Web site or Yahoo, the biller has to get that consumer's billing data over to those points, too.

In the nascent bill-payment industry, two players are strong enough to dictate to the billers the technology they must use. One company is TransPoint, which has a Web site for aggregating all a consumer's bills so they can be paid at one time. The other is CheckFree, which operates as a facilitator between a Web site posting the bill and the biller providing the content.

TransPoint's Lewis Levin: Getting big billers online is an uphill climb.

The lack of a common standard puts pressure on companies that want to provide online bill payment for customers.

"In the short term, Internet billing is not a cost savings because of the cost to get it going," says Gary Wright, manager of IS at Central Hudson Gas & Electric, which this month made its bills available via TransPoint. Earlier this year, the utility made its billing data available to CheckFree.

To handle the different technical demands from TransPoint and CheckFree, the utility called in a bill-payment service bureau, BillServ, to take a simple flat file from Central Hudson and make it available each way the bill aggregators wanted it.

"TransPoint is a more proprietary type of data exchange using a lot of Microsoft tools, while CheckFree is more like electronic data interchange," Wright says.

TransPoint is a venture between Microsoft, First Data and Citicorp that posted the first consumer bills on its Web site for payment in April. TransPoint's goal is to aggregate a consumer's bills so a person can pay all his bills at one Web site rather than have to jump around from site to site.

TransPoint relies on the billing company to install what it calls the Biller Integration System to upload bills, usually from a mainframe to a TransPoint server in Seattle. There, TransPoint posts the monthly bills for its subscribers — the service is free to bill payers.

Archrival CheckFree works under a totally different model. CheckFree operates as an intermediary, providing "sponsors" (companies interested in posting consumer bills, usually the banks) with monthly statements made available by the biller's back-end system via a Web application server. Unlike the TransPoint model, with CheckFree the billing company doesn't have to regularly blast out

See **Payments**, page 46

Start-up offers open authentication system

BY CAROLYN DUFFY MARSAN

VIENNA, VA. — If you're spending too much of your staff time and budget managing passwords, tokens or other authentication methods, consider the latest offering from BioNetrix. The start-up is offering a software package that provides an open platform for managing different types of authentication.

The software can help companies migrate to password alternatives such as biometrics. In addition, BioNetrix officials say the company's client/server software package can reduce password administration costs by as much as 30%. That's a significant savings for large enterprises, which spend as much as $340 per year, per user on resetting passwords, according to Gartner Group, an IT consultancy in Stamford, Conn.

The BioNetrix Authentication Suite lets network managers set up and administer all authentication systems in the enterprise from one console. The software supports passwords, smart cards, tokens, digital signatures, fingerprint scanners, retina scanners, and face and voice recognition systems. It can integrate with enterprise software applications from SAP, PeopleSoft, Lotus, Oracle and Check Point. The BioNetrix software can be managed from a single console or distributed across several machines to avoid a single point of failure.

The BioNetrix Authentication Suite consists of three parts:

- BioClient, which resides on the desktop and communicates with the BioServer software for authentication management. It runs on Windows platforms, but a Unix version is due out early next year.
- BioServer, which resides on the server and handles authentication needs for enterprise applications. It runs on Windows NT, but Unix and Linux versions are due out early next year.
- BioPolicy Engine, which also resides

See **BioNetrix**, page 46

Cable & Wireless' IP VPN.
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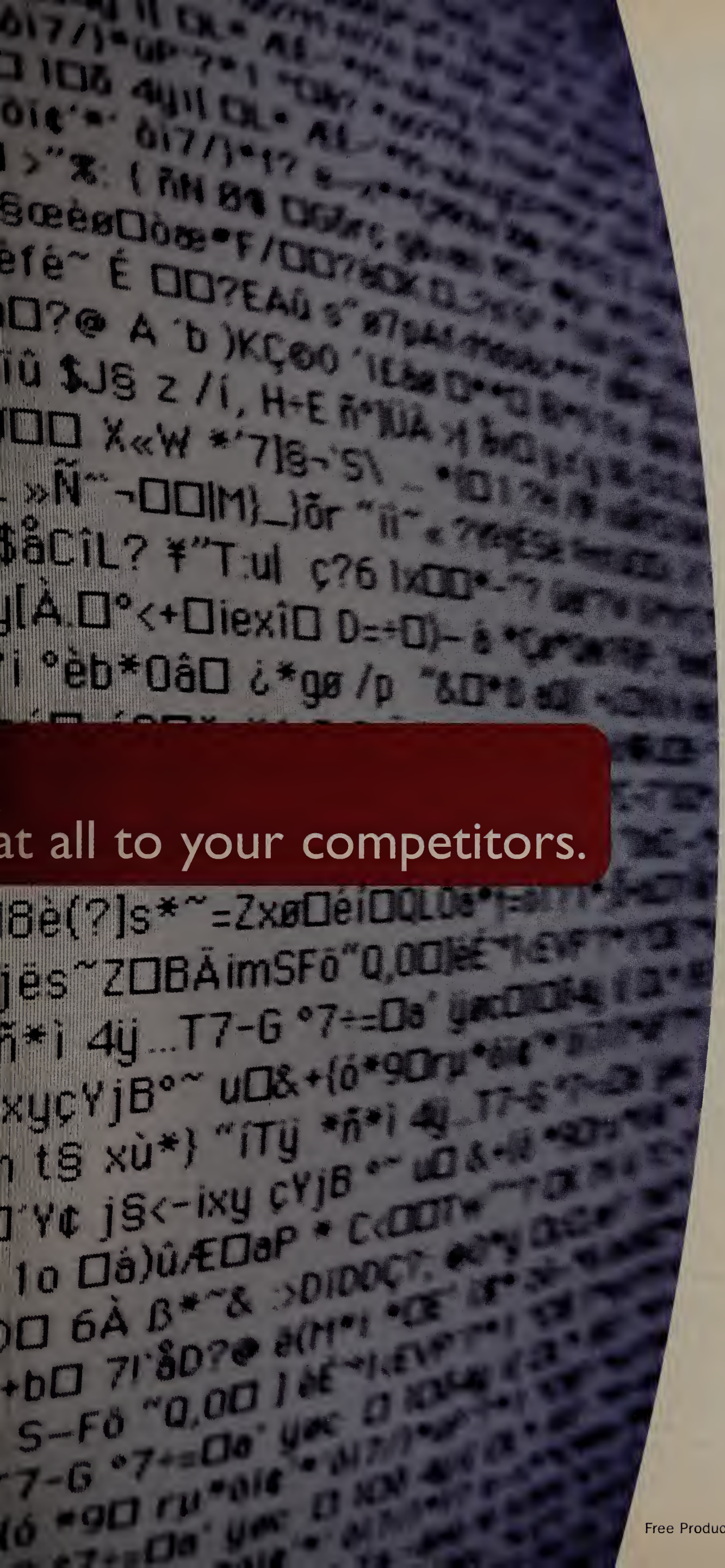

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Mission Critical bolsters NT management wares

OnePoint Operations Manager simplifies the management of Windows NT servers and applications.

BY JOHN FONTANA

HOUSTON — Scalability, reliability and availability are on the minds of IT executives using more and more Windows-based servers. Mission Critical Software is trying to ease these concerns with a one-stop tool to manage Windows NT and 2000 servers and the applications running on them.

Mission Critical's OnePoint Operations Manager recently began shipping as the newest addition to the company's OnePoint suite of administrative software.

A key to Operations Manager is a set of ActiveAgents, which run on each server. On the application side, the agents follow a set of rules to monitor critical application components to ensure the applications' integrity. The agents also can monitor application performance, such as the time it takes two Exchange servers to swap mail, to ensure service levels. On the server side, the agents can assess the health of server hardware, and monitor event logs, flat files and the Windows Management Interface to look for problems such as jammed print queues.

Monitoring Windows-based systems is key as corporations deploy more Windows devices in their nets. Companies such as Net IQ, BMC Software and Heroix also are trying to fill NT management needs.

"Enterprises are becoming more dependent on NT apps like Exchange, and they want them up at all times," says Phillip Mendoza, an analyst with International Data Corp., a market research firm in Framingham, Mass. "The key selling point with Mission Critical is quickness, since monitoring can eat up CPU speed. The way Operations Manager monitors is more database-oriented than script-oriented, and that is more efficient. But this tool is for pure NT deployments; in a mixed environment you may need another tool."

Operations Manager has three different console interfaces, including a Web interface, which can be customized based on the duties and authority levels of individual administrators.

Operations Manager is available now and priced at $1,500 per managed NT or 2000 server.

Mission Critical: www.missioncritical.com

Payments, continued from page 43

large volumes of data. But the billing company is required to provide a view of the billing information on an application server accessible through CheckFree's security token and certificate technology.

Last month, Yahoo started a bill-payment service based on CheckFree, adding momentum to what some researchers claim will be a tidal wave of online bill paying in the future.

One research firm, Killen & Associates, estimates that out of 61 billion bills worldwide, 1.8 billion are paid monthly via the Internet. Forrester Research figures that three million households use electronic bill payment today, and that the number will quintuple by 2002.

With these prospects in sight, the banking industry is pushing for a bill payment and presentation standard that would rely on XML for translating bill information into a common format. The Banking Industry Technology Secretariat (BITS)—the high-tech think tank that's part of the Financial Services Roundtable — says the standard will be completed later this fall.

However, that may not be in time for members of Spectrum EBP, a joint venture involving Chase Manhattan, First Union and Wells Fargo. The firms are just about ready to start sharing billing data via the Internet.

Banks earn revenue from payment processing, and they want to ensure that this revenue stream is not eliminated as more bills get paid on the 'Net.

"We have over 300 million bills between the three of us," says June Felix, senior vice president at Chase Manhattan, who emphasizes that building a foundation for interoperability in sharing bills is paramount to the banks. "We agree on operating rules, and we think it's important this be open and interoperable."

Banks pay CheckFree a fee for each consumer paying his bills online, says Lynn Busing, executive vice president at Norcross, Ga.-based CheckFree. Busing says CheckFree has three million consumers using its service via 350 financial institutions.

CheckFree serves about 40 billers that distribute their bills electronically. The companies include First Union, Schwab, BellSouth, AT&T, MCI WorldCom and Qwest. MCI WorldCom, meanwhile, this month announced it also will provide bills via TransPoint.

Ken Hobday, CheckFree's vice president of standards, co-chairs the BITS working group on the proposed XML-based bill-payment standard (called IFX). But he is not sanguine IFX will be adopted quickly.

"Standards are important, and CheckFree is committed to them," Hobday says. "But CheckFree should not be constrained in a fast-moving industry." Bill presentment is new, and "codifying the business rules constrains what people can do," he adds.

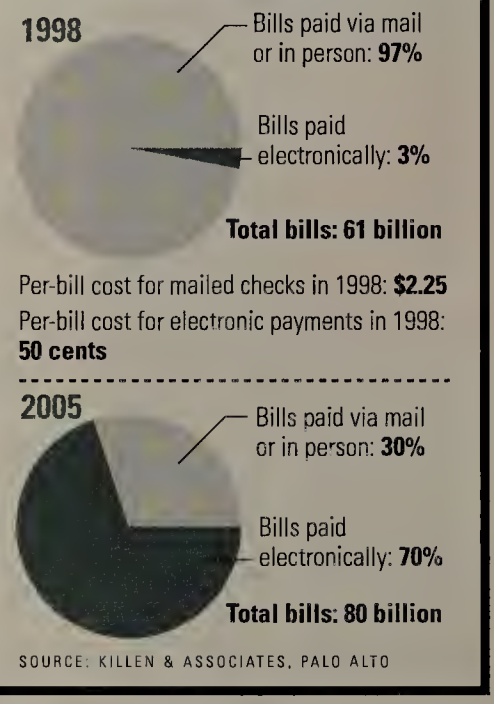
"As the industry grows, it would be wonderful to have a way to exchange these bills," Hobday says.

TransPoint only has "a few subscribers now" and less than 100 billers, with only 25 live on the system, says President and CEO Lewis Levin. He acknowledges it will be an uphill climb to get a nationwide roster of the biggest billers on board in order to make monthly bills available to consumers in volume.

"Everyone agrees IFX is the right idea," Levin says. "But even after you agree, it takes a while for it all to come together." ◪

The check is in the e-mail

Analysts predict that most bills will be paid electronically in the next several years, saving money for individuals and companies.



SOURCE: KILLEN & ASSOCIATES, PALO ALTO

BioNetrix, continued from page 43

on the server and lets the network manager set authentication policies for applications, workgroups and individuals. Policies can change depending on whether the employee is in the office or working remotely.

BioNetrix is targeting four markets for the software: financial services, pharmaceuticals, government and utilities. Although the software is just being announced, it has been tested in pilot projects over the past several months and is currently in Version 3.0.

One user of the suite is drugemporium.com, the electronic commerce arm of Drug Emporium, Inc., a pharmacy chain. The Web-based subsidiary is testing an application that puts pagers with built-in fingerprint scanners in the hands of physicians and allows them to order prescriptions over the Internet. To meet state regulations, the system must ensure confidentiality of the information as well as biometric verification of the doctor and the pharmacy. The Web site is using the BioNetrix software to handle the authentication for the system, says Matthew Erick, director of pharmacy operations.

"In picking BioNetrix, we felt they had one of the best devices to ensure security," Erick says. "The system allows us to identify that the prescription was received by a licensed pharmacy and that the doctor is who he says he is."

Erick says the BioNetrix software offers flexibility in terms of the biometric devices it supports. "There's not just one component. It supports fingerprint or retinal scanning, so we can meet different requirements in different states," he adds.

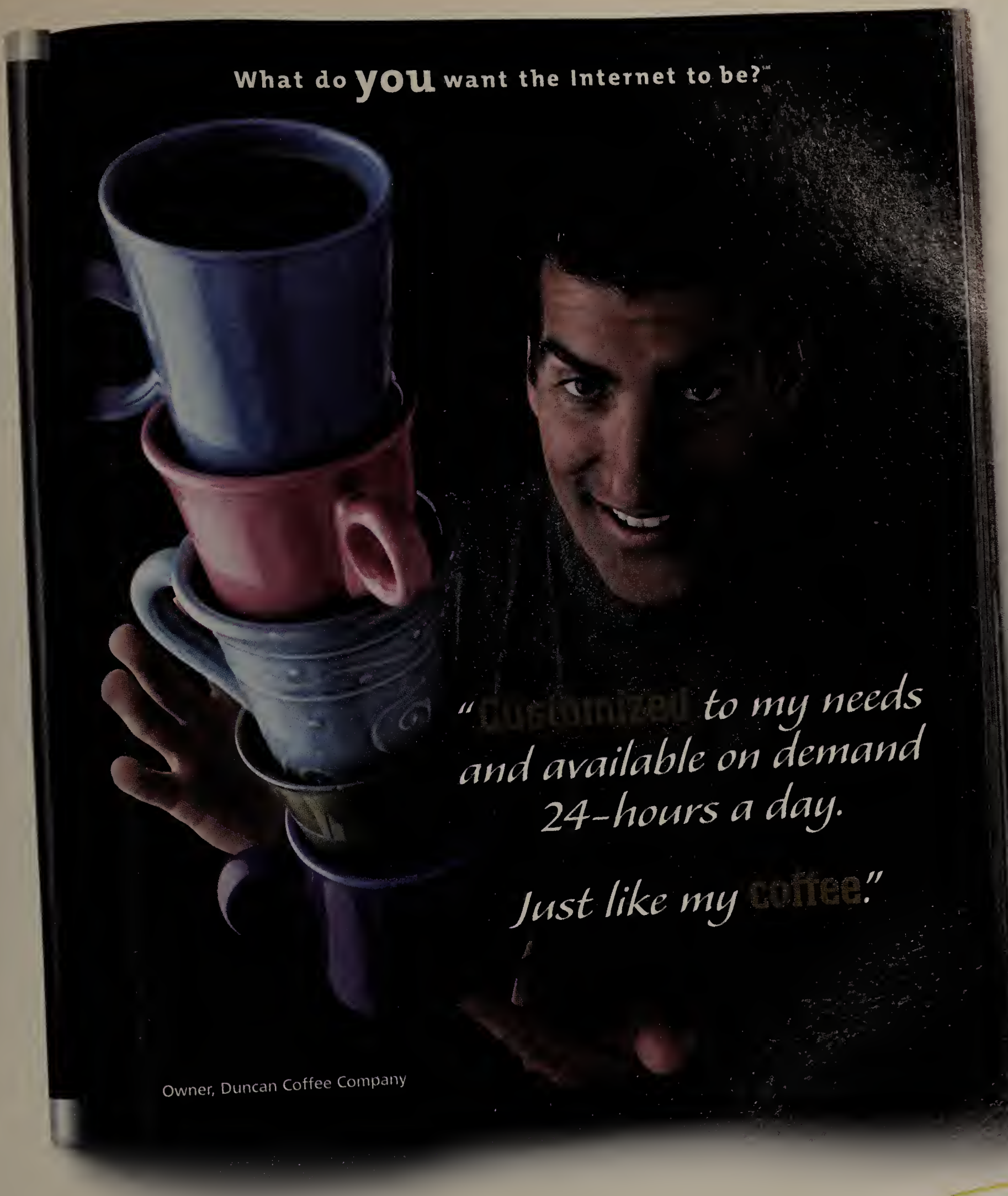
The BioNetrix Authentication Suite costs about $50 per user. A Biometric Starter Kit, which sells for $2,500, features the BioNetrix authentication software as well as two fingerprint, voice and face recognition devices.

Until now, 2-year-old BioNetrix has been operating in stealth mode, formally launching itself and its product this month. Nonetheless, it has attracted the attention of security luminaries. Steve Walker, founder of Trusted Information Systems, sits on the company's board of directors, as does Cybercash founder Bill Melton.

BioNetrix appears to have carved out a hot niche. Frost & Sullivan, a Mountain View, Calif., market research firm, estimates the user authentication and biometric market will nearly triple between now and 2002, when the market is expected to be worth more than $4 billion. Software such as the BioNetrix Authentication Suite is expected to become more attractive to enterprise customers as biometric devices become integrated in standard computer keyboards and laptops.

"We think that in three to five years, biometric devices are going to be fairly pervasive," says Pete Bianco, co-founder and CEO of BioNetrix. Bianco says BioNetrix' software suite "allows users to migrate to the future."

BioNetrix:www.bionetrix.com



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'Net Insider . Scott Bradner

PROTECTING AGAINST KNOWLEDGE

If you have a sensitive nature, you should not read this column. According to the Internet gateway manager at a large international company, this column contains a word that is "abusive."

I'm managing an IETF mailing list (www.ietf.org/mailman/listinfo/raven) that's looking into what the IETF should do if we are faced with a request to add legal intercept (wiretapping) functions to IETF protocols. As the list's manager, I get sent copies of any messages concerning delivery problems the mailing list finds.

The other day I received the following: "This message was rejected and nondelivered by our Internet Mail Gateway [this scans all incoming and outgoing Internet messages]. The message was rejected because of abusive or offensive content. Please reword the message and resend it."

I exchanged mail with the gateway's manager, and after searching the mailing list archives I determined that the rejection was because of this paragraph from someone who did not like the idea that the IETF might develop protocols with wiretapping functions:

"If the Federales [sic] want to develop such an application, let them do it. I'm certainly not about to commit time and money developing an application and/or hardware interface that benefits THEM! Isn't that why they take 40% of my paycheck each week, so that they have money to piss away on stupid stuff like that?"

The gateway manager said: "We do a general check for abusive words, not a context search. If any abusive words are found, the e-mail is stopped either going out or incoming. Our users accept this limitation and are happy to remain within [sic] it." Due to the outbound filter, the gateway manager had to type the offending word on four lines with one character each.

Because the IETF mailing list software automatically unsubscribes any entry that causes a bounce, the subscriber at this company is no longer receiving postings from the list. The company policy has protected him from what the company sees as abuse — as well as from the important discussion taking place on the mailing list.

I can see why a company might want to filter language in outgoing mail that in one way or another might harm the company or its image. Simple word scans will not catch misstatements of fact that are the most likely to harm the company, but flagging deeply offensive language is an understandable protection. But extending this to blocking incoming mail containing a word that some 5-year-olds use comfortably is more depressing than anything else.

This company demonstrated a mistrust of its employees that is impressive indeed. The image of happy employees, protected at work from the evils of the world by a paternalistic management that treats them like children is a very sad one to me.

Disclaimer: Harvard's mission is to get people to think, so treating them like children would be counterproductive. But the above lament is mine.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@harvard.edu.

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Technology Update

An Inside Look at the Technologies and Standards Shaping Your Network

Ask Dr. Intranet

By Steve Blass

We have been setting up our Windows NT servers with IPX and using IPX-type-20 propagation in our routers so the NT machines can see each other across routers. But we're moving away from IPX, and I wonder if we can do something similar with TCP/IP.

Via the Internet

You can use TCP/IP to let your NT machines see each other across a router. Specifications for running NetBIOS over TCP/IP are documented in IETF RFC 1001 and RFC 1002.

In the Windows TCP/IP settings dialog, under the NetBIOS tab, check the "I want to enable NetBIOS over TCP/IP" box. Once you have WINS name services (or LMHOSTS files) in place to map NetBIOS names to IP addresses, everything should work except network browsing. For browsing, you need a Master Browser on each net segment. The Browse Master parameter in the Advanced Properties for File & Printer Sharing for Microsoft Networks dialog box controls whether a machine can serve as a Master Browser. Setting it to "Automatic" lets a system become the Master Browser for a segment.

You'll also need to issue the commands "no IP forward UDP port 137" and "no IP forward UDP port 138," because the Cisco Dynamic Host Configuration Protocol relay agent forwards NetBIOS name and datagram server packets by default (which you don't want). The commands will prevent the forwarding of server announcements to the wrong Master Browsers.

Blass is a network architect at Sprint Paranet in Houston. You can reach him at drintranet@paranet.com.

New T-1 bundles bridge gap to T-3

BY DAN PALMER

As Internet use increases, enterprises are outgrowing the 1.5M bit/sec capacity of copper T-1 lines, which means facing the huge price, bandwidth and availability gap between T-1 and fiber-based T-3 with its 45M bit/sec capacity.

In many locations, T-1 monthly access charges are below $500, significantly less than the $4,000 or more charged for a T-3 line. Additionally, T-3 is unavailable to most businesses in the U.S., and provisioning can take months where it is available.

This situation has driven the search for a new class of products able to break through the performance bottleneck of previous packet-based multilink solutions. To accomplish this breakthrough, the prospective products must bundle multiple T-1 circuits at wire speeds, using standards-based Multi-Link PPP (MLPPP) and Multi-Link Frame Relay (MFR) protocols.

For strong performance and low latency, these products need to segment packets into fragments and transport each fragment over a separate member of the T-1 bundle. At the other end of the link, the fragments will be reassembled after compensating for up to 128 msec of differential delay between the T-1s. The packet fragments must maximize the bandwidth available for customer IP traffic while avoiding the bandwidth inefficiencies associated with technologies such as Inverse Multiplexing over ATM. All T-1s in the bundle also must be highly efficient to provide truly plug-and-play performance, but the arrangement must not require load balancing or packet tuning.

The increased robustness available from a packet-based, multiple-link technology is critical for this new brand of bundled lines because the multilink virtual multimegabit access path must continue to operate reliably even if one of the links in the bundle is experiencing error, test or failure conditions. Removing the problem circuit from the bundle, decreasing the bundle bandwidth accordingly, and then reinstating the circuit once the anomaly has cleared will solve the reliability issue. Standards-based MLPPP and MFR protocols provide methods to ensure bundle recovery when individual circuits have problems, increasing overall network reliability.

To create a virtual multimegabit access path between an end user and a service provider point of presence requires multilink customer access and POP aggregation equipment. The equipment must fit seamlessly into the current network infrastructure to maximize its use while reducing overall deployment costs.

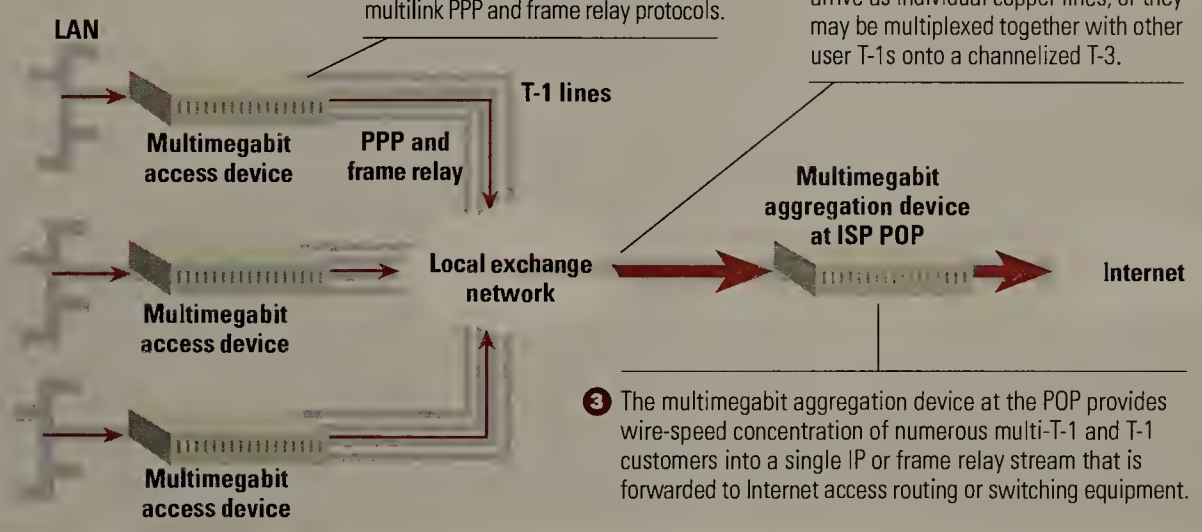
This next generation of multimegabit access products will enable ISPs to offer a new service, generate new revenue and differentiate themselves from competitors. ISPs will be able to layer services such as virtual private networks and quality-of-service agreements on top of this new service. The virtual multimegabit access path will let service providers offer business subscribers that have reached the limit of T-1 access a practical and affordable way to migrate to higher speeds without making the huge leap to T-3.

Palmer is president and CEO of Tiara Networks in San Jose, which designs and manufactures access and aggregation concentrators for ISPs. He can be reached at info@tiaranetworks.com.

HOW IT WORKS

Forming a virtual multimegabit path

Bundling multiple T-1 lines provides readily available copper-based Internet access at speeds from 1.5M bit/sec to 24M bit/sec. The technique can prove useful for organizations whose needs have surpassed the capabilities of a single T-1 but are insufficient to justify the leap to T-3.



1. The multimegabit access device provides wire-speed forwarding of traffic from the LAN or router over a virtual access path created by bundling up to 16 copper T-1 lines using standard multilink PPP and frame relay protocols.
2. The T-1s are transported from the user facility through a local exchange network to the service provider's POP. The T-1s arrive as individual copper lines, or they may be multiplexed together with other user T-1s onto a channelized T-3.
3. The multimegabit aggregation device at the POP provides wire-speed concentration of numerous multi-T-1 and T-1 customers into a single IP or frame relay stream that is forwarded to Internet access routing or switching equipment.

Gearhead — inside the network machine . Mark Gibbs

WORKING WITH THE NT WEGISTRY

"Be vewy, vewy qwiet, I'm wegistry hunting." — What Elmer Fudd might have said had he had to deal with Windows.

Are you sitting comfortably? Then Gearhead will begin: Once upon a time there was Windows 95, and Bill looked upon it and said: "This is good but not nearly complicated enough — let's juice it up, boys. Howsabout a registry?" And thus it was so engineered, and Bill smiled on the OS and saw it was good . . . for masochists.

OK, so last week Gearhead threatened you with the horror of the NT registry and being a geek of his word, here it is: The horror is that the NT registry is even more bizarre than the Windows 95/98 scheme. Honest.

Not content to have the registry splurged across just a couple of files, as with Windows 95 and 98, NT also uses something called hives. And just like hives that appear when some people are stressed or allergic, NT hives are a rash of lumps (OK, they're really files) in the subdirectory \%system root%\system32\ config.

Note: Systemroot is an environment variable. Start a copy of COMMAND (use the RUN command on the start menu) and at the resulting DOS prompt type "SET" and examine the output. Normally systemroot is set to "c:\winnt" but yours may vary.

The actual hive files contain registry keys, and the list of current hive files can be found by firing up REGEDIT and opening the keys HKEY_LOCAL_MACHINE\System\CurrentControlSet\Control\hivelist. Under this hierarchy of keys you'll find the hive files listed. In the subdirectory where the hive files are you'll find .LOG files for almost all hive files. These record changes made to each hive. There are also .SAV files that are backup copies of their corresponding hive.

And as if that's not enough, there's also a unique alter ego for the SYSTEM hive: SYSTEM.ALT. If the PC crashes and damages the system hive (critical to initializing the operating system), the NT boot loader can automagically replace the faulty hive with the SYSTEM.ALT backup.

All of these files are held open by the NT kernel for exclusive access so you can't rename, delete or move them. But you can back them up. Backup can be done with Microsoft's NTBACKUP.EXE or, if you lash out and buy the NT Server Resource Kit, REGBACK.EXE. The big advantage of REGBACK is that it will back up the registry onto media other than tape, the only media supported by NTBACKUP.

If you want to edit the NT registry, you have two choices: REGEDIT, which behaves more or less identically to the Windows 98 version, and REGEDT32, which opens any branch under a registry key in its own pane. REGEDT32 is definitely worth getting familiar with, as it provides a lot more functionality.

At this point Gearhead hesitates to go much further into the guts of the NT registry system, because the sheer weight of detail could fill the column over and over again.

To better understand the registry, Gearhead strongly recommends, *Managing the Windows NT Registry*, by Paul Robichaux — a comprehensive, if somewhat brain-numbing, book.

So what neat key settings are there? Howsabout being able to boot NT and automatically log on as a specific user? Find HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\WindowsNT\CurrentVersion\WinLogon and add the value AutoAdminLogon with the data type REG_SZ and set the data to "1". Then edit DefaultDomain, DefaultUserName and DefaultPassword as required.

If you're really tuning up your security, you might want to hide the name of the last user to log on. Find the same key we used for the auto logon and add a value named DontDisplayLastUserName with a data type of REG_SZ and set it to "1".

Cool, huh?

And remember, if you make registry changes, back up first and be vewy, vewy careful.

Settings to gh@gibbs.com

Network World Fusion Spotlight

News, tips and tools from our Web site

Managing directories

As if there wasn't enough to argue about these days, get ready to throw directory management on the pile. In this month's Fusion Face-off, Entevo and ISOCOR go to the mat over which approach to directory management is best. Entevo chief Amir Hudda says virtual directories hold the most promise. But Ian Goldsmith, ISOCOR's director of product strategy, says metadirectories are the right combination of middleware and enterprise application to bolster your network. Both executives are online this week to defend their positions and answer your questions.

DocFinder: 5222

Help Desk

This week's question involves Class C addresses. A reader has run into problems setting up his second Class C network. "Does each Class C have to have its own router? And should I subnet before implementing the second network?" he asks. Ron Nutter recommends staying with the same subnet mask for all of the reader's Class C address ranges. But head online to read some of the IP troubleshooting techniques he uses to solve the reader's problem.

DocFinder: 5229

Internet wiretapping

Should the Internet Engineering Task Force (IETF) help the government tap into your Internet traffic? The standards group has been called upon by government officials to develop protocols that would make it easier to track messages across the 'Net. But even the IETF has its doubts about whether wiretapping should be supported in protocols for switches that will combine voice and data traffic for transmission over the 'Net. What do you think? Let us know in our forum.

DocFinder: 5230

Unraveling SMON

Switched networks pose a special challenge to network managers because the very capability that makes them efficient — full network bandwidth allocation to single end points — also makes them difficult to monitor and control. To get the big picture of network activity and drill down to specific switches, segments, flows and application traffic, managers need a new approach to net monitoring. This is what the newly ratified Switch Monitoring (SMON) standard is all about. Head online for a detailed look at SMON, including a diagram of how it works and the IETF's standard.

DocFinder: 5231

Microsoft as an ASP?

Microsoft President Steve Ballmer outlined plans earlier this month for the software giant to become an application service provider. Readers are mixed on whether Microsoft should enter this growing market. "The problem with it is that an application serving environment will require even more bandwidth on the existing physical internetworking infrastructure, which is already a serious concern now. If Microsoft starts banking on application serving, it will be more dependent than ever on third-party traditional PSTN owners such as AT&T," one reader says. What do you think?

DocFinder: 5232

Help Desk

Ron Nutter is standing by to answer your networking questions. Read his column every week on Fusion. DocFinder: 2450

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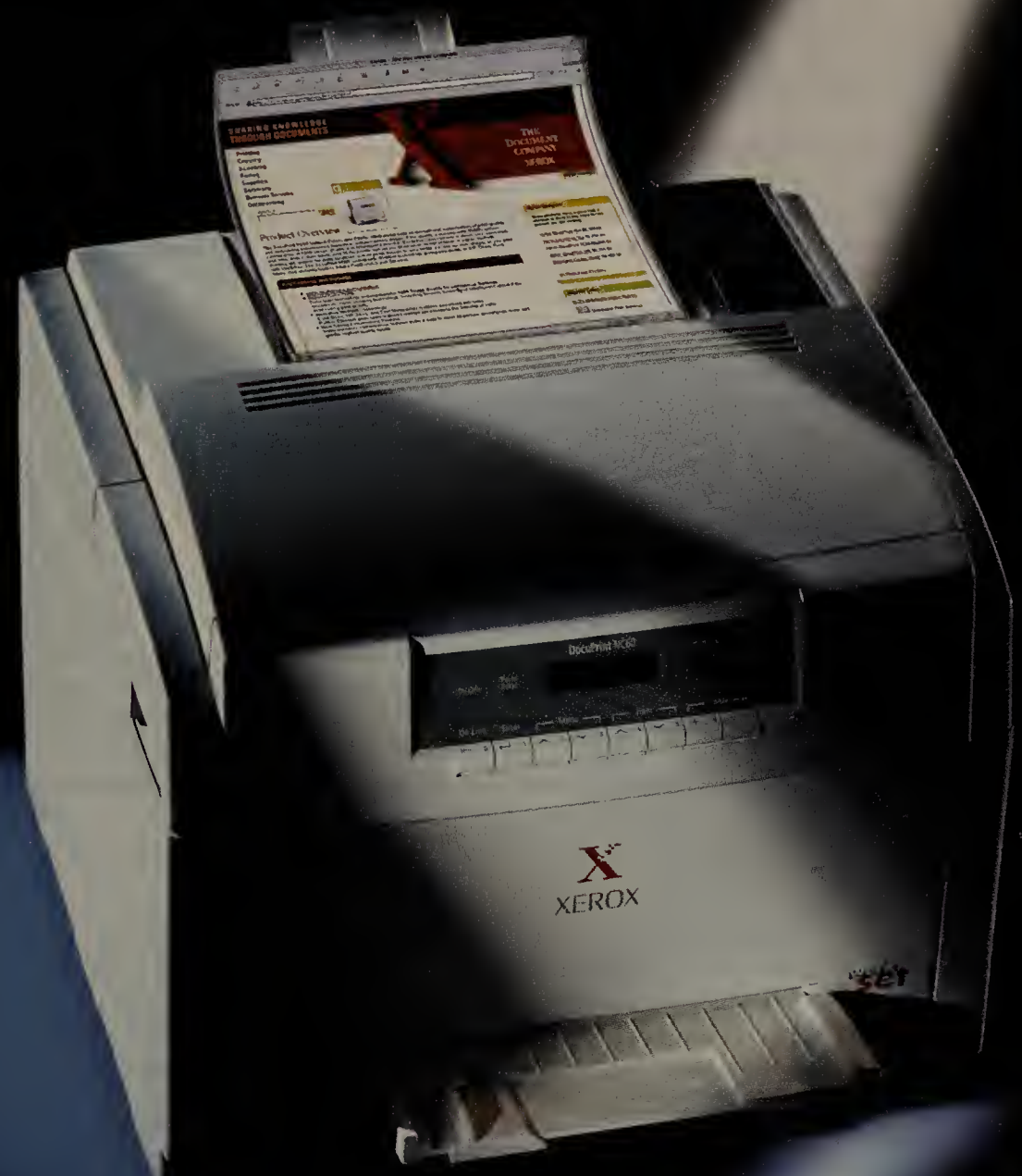

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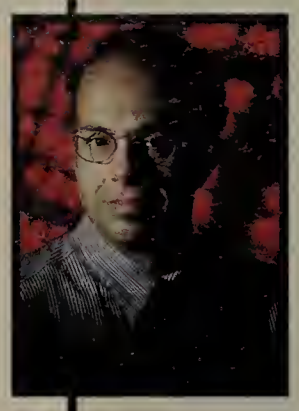
Opinions

Editorial

My Top 10

I was relaxing with some colleagues at a local watering hole last week when we started arguing over the most pressing technology issues of the day.

After going this way and that, we finally came up with the following list. We intentionally avoided budgetary and staffing concerns, figuring those were givens.



- **Y2K.** Not much argument here. Regardless of how well you've prepared, you can't rest until you've outdistanced this beast. The great unknown is the ripple effect. How many small, unanticipated events does it take to create a cascading catastrophe?
- **Internet.** Another layup. Everything from intranets to extranets to electronic commerce. While saving money with things like virtual private networks is important, the real power is using the 'Net to change the way you interact with business partners and customers.
- **Higher-speed everything.** It's hip to say bandwidth is a commodity, but it isn't easy to predict how much you'll need, where and when. And it will get harder as we adopt things such as streaming and convergence.
- **Managed bandwidth.** Adding fatter pipes won't always be the answer. That's where quality of service comes in. Start looking for specific routes where you can adopt it.
- **IP everything.** The trick is finding applications that can benefit from voice over IP so you can implement it now and learn as you go.
- **Application hosting.** There isn't a single software vendor out there that isn't scrambling to see how it can morph its business into a network-based service business. You'll have to be sure your organization understands the consequences of moving to this model.
- **Directories.** Microsoft's Active Directory will begin to convince companies to move to directory-enabled networks. It won't happen overnight, but it's time to craft a plan for a companywide integrated directory.
- **Streaming media.** Companies are saving millions of dollars per year using streaming tools to do everything from replacing videotape distribution systems to supporting training. But is the network ready?
- **Teleworkers.** The crush is still on to accommodate an ever-increasing number of employees who want to work from home. Crafting a solid support plan is critical.
- And finally, **conserving WAN costs.** Determining how to get more for less remains critical because the WAN budget is still so huge.

Does this list match your own? If not, let me know what you would swap.

— John Dix
jdix@nww.com

Message Queue

Not a booth babe

Regarding Susan Bieberfeld's letter to the editor "Add sexism to ageism" (Oct. 11, page 54):

Sexism is pervasive. I have an engineering degree in aerospace. I have had the same experience Bieberfeld describes — of people ignoring what I say but taking the same advice or instruction from a male colleague.

Not only have I pulled cable, I have climbed through cable ducts and piloted cherry pickers. I was an active member of the group that wrote the MPEG-2 standard. These days, when I find myself on trade show booths, visitors assume I am a "booth babe." The only benefit I can find from all of this is that when someone comes to the booth at the end of the day and asks to speak to an engineer, I can hand him off to a male colleague who knows less about the technology than I do and save my voice. I had pondered getting gray highlights to look older, but I gather that doesn't work, either.

I can only wonder, if sexism is this bad in high tech with such a skills shortage, how much worse must it be in more mundane areas of industry?

Louise Wasilewski
Alpharetta, Ga.

What processors need

I agree with Tom Medrek's outline of the need for network processors ("Network processors speed progress," Oct. 11, page 51). Combining speed and programmability will give OEMs an important building block. Programmability, in particular, will speed product development cycles, making it easier to upgrade via software and eliminating the need for forklift upgrades.

Additionally, I agree that Reduced Instruction Set Computing processors, because of their generalized architectures, will not meet the needs of next-generation networks. Future architectures must be designed from the ground up to be network processors. With the explosive growth of the Internet, it will be critical for these new architectures to scale to meet the ever-increasing need for both bandwidth and complex Layer 2 through 7 data processing.

New programming languages are also required. Just as SQL was developed to provide a super-efficient database language, powerful, high-level languages designed for communication applications must be developed. Because software development will replace the hardware development model in the Application Specific Integrated Circuit world, it will be imperative that these new languages provide an order of magnitude improvement in efficiency and ease of development.

Bob Bridge
Vice president of marketing
Agere
Austin, Texas

An old idea

In her column "ASPs make a strong case for renting vs. buying apps" (Sept. 27, page 37), Linda Musthaler states that "the ASP model is in its infancy." In reality, an application service provider is nothing more than a glorified service bureau, and service bureaus have been in existence since the late '50s. The only difference is in the way companies would gain access to the hosting mainframe and/or network.

The reasons Musthaler gives for using an ASP are valid. My only point of contention is that the article presents this service as something new.

Raymond Zinicola
Administrator
OMNI Orthopaedics
Canton, Ohio

Listen up, execs

Mark Gibbs' "Backspin" column "Dear Exec: Listen to the expert" (Oct. 4, page 98) was great. I've seen both sides of that story and can really relate to it. There is another side to the Clueless Exec, though.

I belong to a NetWare User International group and have had the opportunity to associate with many different business groups in town. I've seen many executives put someone such as the human resources manager in charge of their LAN in an effort to save money. These execs just don't realize how much they are hurting their business by not having someone with some basic network knowledge around.

David Maurice
San Antonio, Texas

Send letters to nwnews@nww.com or John Dix, editor in chief, Network World, *161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification.*

Intranet Adviser . **Daniel Blum**

DON'T WAIT UNTIL PKI HAS GROWN UP TO PUT IT TO USE

Today, public-key infrastructure (PKI) — the technology for managing public and private keys and digital identity certificates — is still in its adolescence. The technology has tremendous potential for securing electronic business, budding market demand and promising products, but also suffers from continuing manageability, interoperability and deployment problems.

Adolescent or not, PKI will significantly affect enterprise IS infrastructures. Public-key encryption and digital signature support is now built into e-mail, virtual private networks (VPN) and other software packages. While some packages require a special-purpose PKI, such as Microsoft Certificate Services or Lotus Notes/Domino, many applications can work with general-purpose PKIs designed for multivendor and multiplatform environments.

The question is, do you wait until PKI is fully grown, stop all enterprise deployment and risk losing ground to competitors in the brave new electronic business world? Or do you move ahead aggressively and take the smaller risk of getting burned by cost or schedule issues?

If you go ahead with PKI, don't let too many special-purpose PKIs proliferate. Some of them are hard to scale or don't incorporate the latest industry standards. And each requires its own policy documents, recovery mechanisms, trust relationships, risk analyses and administration processes. Defining these in a duplicative, inconsistent way can be expensive or downright hazardous to your electronic business health.

Once you decide on a general-purpose PKI, you must determine whether to manage critical PKI components such as certificate authorities internally or outsource the task to a public certificate authority service.

Insourced PKI from vendors such as Entrust Technologies, Baltimore Technologies and Xcert give you greater control of your own destiny. You can set your own certificate and key management policies and engineer your infrastructure to comply with these policies. In addition, insourced PKI products are more feature-rich, and thus more flexible, than outsourced PKI services.

Outsourced PKI services from vendors such as VeriSign, Thawte and GTE also have advantages. Costs and schedules are more predictable because you can leverage existing expertise. You're subject to the outsourced PKI service provider's policies, but can gain improved interoperability by joining the provider's trust network.

Cost is obviously a concern, as well. Insourced PKIs cost less per user than outsourced PKIs, but overall support costs are higher. You will have to issue a significant number of certificates before your insourced PKI investment begins to pay off.

A wise approach may be to get your feet wet with a PKI pilot involving a few users and an outsourced PKI solution. You can then switch to an insourced solution as usage rises.

Blum is senior vice president and principal consultant with The Burton Group, an IT advisory service. He can be reached at dblum@tbg.com.

Yankee Ingenuity . **Howard Anderson**

INTERNET 'KEIRETSUS': 'NET FIRMS FIND STRENGTH IN NUMBERS

Have you been following the battles between eBay and Auction Watch or X.com and Wingspan? If you're wondering which companies will triumph, first take a look at which Internet "keiretsus" they belong to.

In the Japanese tradition, keiretsus are vertically linked cartels. Keiretsu members do business primarily with one another, with each controlling some major facet of commerce. For example, the Sumitomo Keiretsu is strong in shipping, heavy manufacturing, banking, insurance and technology. NEC, which is a member of the keiretsu, does a lot of business with Sumitomo Heavy Industries, finances through Sumitomo Bank and ships its goods on Sumitomo freighters. Each of the companies is independent, but there is substantial cross-ownership and board redundancy.

Keiretsu members do business with companies outside the keiretsu but give "most-favored-nation" status to fellow members. For example, if Softbank Ventures goes pitching a new start-up today, it doesn't take long for Softbank to bring up its relationship with Yahoo, in which it has a substantial investment. Or Kleiner Perkins Caufield & Byers will trot out its portfolio company Excite@Home and suggest to a new investment that a "strategic relationship" between the new company and Excite@Home could easily be arranged. Or Disney can talk to fledgling companies, holding up Infoseek and its Go network as bait.

And like the fully integrated Japanese keiretsus, each Internet keiretsu will have a full array of Internet assets: search engine, portal, online e-commerce shops, e-bank, insurance company, auction site and so forth. Whatever part each keiretsu doesn't yet have, it will build or buy into. Then the keiretsu will post links to its newly acquired companies from its own site and make these new companies work better.

The keiretsus will line up against each other like football teams. Furthermore, they sometimes will combine with one another if any one keiretsu seems to have an unassailable position.

That's the one issue the keiretsus worry about — that any one of them will gain power over the Internet the way Microsoft has power over PC operating systems and applications or Intel has power over chips. In any case, there will be nine or so key Internet keiretsus (Kleiner Perkins, Paul Allen, CMGI, AT&T, Idealab, Softbank, Microsoft, Disney and AOL) and a gaggle of wannabes.

Entrepreneur Bill Gross has used the Internet keiretsus concept at Idealab, a so-called "incubator" for Internet businesses, and it's working like a charm. Full disclosure: I'm starting a high-tech Internet incubator, YankeeTech Incubator, right next door to the Massachusetts Institute of Technology, and I have been receiving offers and some not-so-subtle threats from the keiretsus. Their message: Let us invest in your incubator fund, and your young companies will have access to our muscular Internet friends and the powerful cyberspace brands we control. Don't let us invest, and your phone calls may not be returned in your lifetime and your e-mail will somehow never hit our server.

Guy Kawasaki, former Apple evangelist and CEO and founder of Garage.com, a firm that helps high-tech start-ups find venture capital, tells young start-ups that their "killer app," which they think is unique, probably is simultaneously being developed by five other start-ups. In fact, says Kawasaki, if a similar app isn't under development by that many other companies, it probably isn't very good. Which one of these start-ups succeeds? Probably the one that is wired to the right keiretsu.

The Yankee Group estimates that there are now 10,000 Internet start-ups and business plans around — because everyone we meet can talk about nothing else. They can't all succeed; soon there will be more online pet supply stores than there are cats. But the one that gets favorable positioning at AOL or Yahoo or eBay clearly will have advantages over the others.

The traditional advice to young companies is speed at all costs. Not bad advice, but not quite accurate; what is more important is that key strategic call. Strategy has to go beyond hiring quickly, marketing heavily and running big deficits. Sooner or later, young companies will need the strategic alliance that is the mother's milk of the Internet keiretsu.

While there is nothing wrong with or illegal about Internet keiretsus, they bear watching because this is where the corporate battles of the near future will be fought. I predict that the Department of Justice will one day attack the Internet keiretsus because they will be in restraint of trade. Good luck. MacArthur tried to break up the Japanese keiretsus and failed, and I don't expect the justice department to be any more successful.

Anderson is founder and president of The Yankee Group, a Boston-based consultancy. He can be reached at handerson@yankeegroup.com.

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FACE-OFF

What is the best directory management approach?

Entevo touts the benefits of virtual directories; ISOCOR recommends metadirectories.

BY AMIR HUDDA, ENTEVO

Anecdotal data suggests that as many as 180 directories are used within a typical organization, only a dozen or so of which are really important. Effectively managing these directories has become a challenge -- one that virtual directories are uniquely qualified to meet.

A virtual directory is an application that allows management services to be performed across multiple directory services by using index mapping technology rather than creating an additional directory. The virtual directory doesn't store directory objects; rather, it stores information used to access directories and determine relationships among the directory objects.

Virtual directories enable a wide range of administrative activities — including object synchronization — across multiple directory namespaces. By contrast, a competing technology, the metadirectory, focuses solely on object synchronization, accomplished through technical approaches ranging from brokering to creating a master directory store.

Industry interest in metadirectories is high, due in large part to Microsoft's recent acquisition of metadirectory vendor Zoomit. However, with the possible exception of unique application-driven requirements, most organizations will find that a stand-alone metadirectory solution can't be cost-justified.

Why? Time and cost are the principal factors. Experts suggest that complete implementation of a metadirectory can take years and cost millions of dollars. Beyond their synchronization capabilities, most metadirectories do little to ease the day-to-day administrative duties of network and systems managers. Indeed, by adding yet another directory to an already complex mix, a metadirectory may actually increase administrative burden. In addition, programmers must use the proprietary application programming interfaces dictated by the specific metadirectories, a process that can be burdensome.

Virtual directories, on the other hand, offer several major benefits over metadirectories.

First, because a virtual directory doesn't add another directory to the mix, additional infrastructure demands and administrative overhead are avoided.

Second, virtual directories are quicker and easier to implement. Basic administrative activities are immediately enabled and available in virtual directories, reducing implementation to a fraction of the time required by metadirectories.

Third, virtual directories have a wider range of managerial capabilities. These include searching, reporting, single-console administration of multiple directories, delegation of authority, migration and workflow processing. This diversity lets organizations leverage the critical store of information contained in enterprise directories.

These key advantages make virtual directories far more cost-effective and practical than metadirectories for most enterprises.

Hudda is chairman, co-founder and CEO of Entevo, an Arlington, Va., provider of cross-platform directory management products. He can be reached at (703) 524-1900 or ahudda@entevo.com.

BY IAN GOLDSMITH, ISOCOR

Before we can discuss the advantages and disadvantages of metadirectories and virtual directories, it is essential to understand what both are.

A true metadirectory combines middleware with an enterprise directory. The middleware integrates the enterprise directory with intranet and extranet systems such as e-mail, operating systems, human resources and security databases, as well as workflow systems. A single entry is created in the enterprise directory that contains, or points to, information in all connected systems.

A virtual directory, on the other hand, delivers a fat client that connects to all of the connected systems independently to read and manage their data.

Virtual directories struggle in environments with existing applications and directories because they lack the concept of "the join." The join allows a metadirectory to identify information about the same person or thing in different systems, even if the systems use different names. For example, HR applications use the full legal name Robert M. Smith and an e-mail system uses the friendly name bob.smith to identify the same person. Because the virtual directory does not have a central store it can use to consolidate objects, it cannot resolve this kind of naming discrepancy.

Proponents of virtual directories will often claim that a metadirectory requires an additional directory service. In reality, a well-designed metadirectory will use an existing directory as its central store.

Virtual directories are limited; basically, they can be used to independently manage different network operating systems such as Windows NT, Windows 2000 and NetWare. Metadirectories, on the other hand, can integrate HR, security and enterprise resource planning applications with a comprehensive set of user-oriented applications, including e-mail systems, network operating systems and workflow applications. Metadirectories can also deliver a tightly integrated directory foundation that provides a public-key infrastructure or directory-enabled network.

A metadirectory will typically be deployed in an organization to provide not only a single point of access to administration of directory information, but also to provide an automated, intranet administration service. Many organizations are using metadirectories to integrate security or HR administration with intranet applications. When the HR or security administrator adds, updates or deactivates a user, the metadirectory will apply a set of business rules to create, update or deactivate/remove the appropriate user accounts in all connected intranet applications. A virtual directory simply provides another management tool for administering a small set of the connected applications; it does not offer a rule- or policy-based integration mechanism.

The bottom line is that metadirectories are a low-impact approach to comprehensive enterprise intranet integration. Virtual directories are a narrow approach for deploying and managing a small set of new applications.

Goldsmith is director of product strategy at ISOCOR, a Santa Monica, Calif., supplier of Internet messaging, directory and metadirectory products. He can be reached at (310) 581-8100 or ian.goldsmith@isocor.com.

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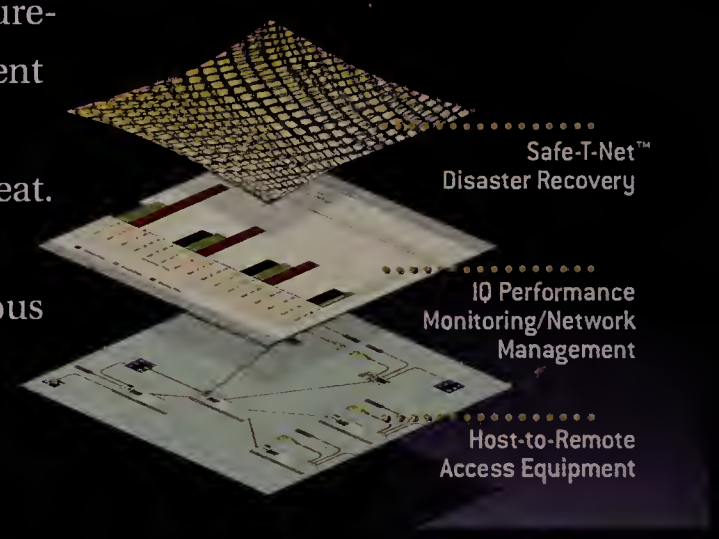

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Feature

MANAGED WAN-a-phobia

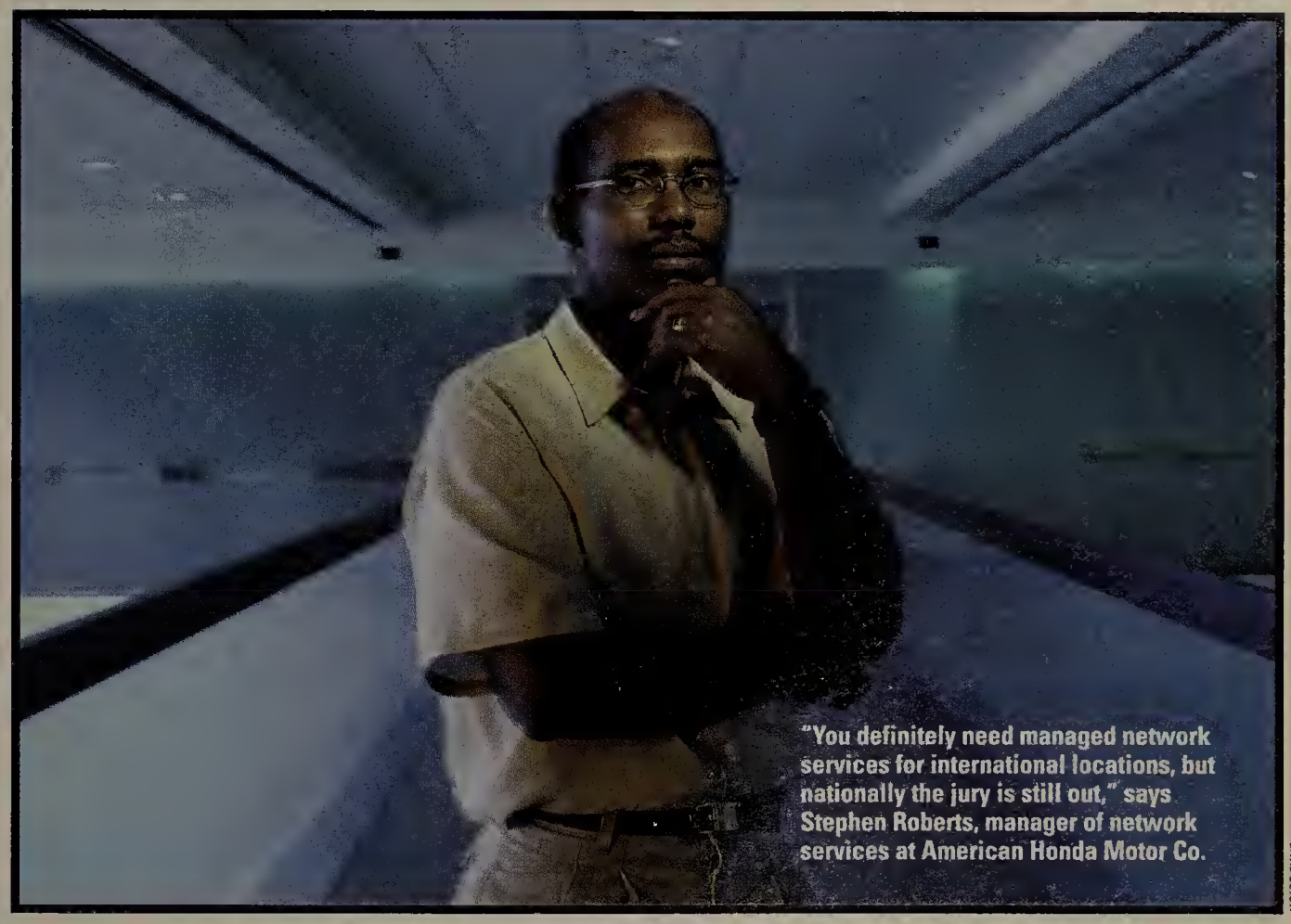
Fear of giving up control haunts corporate networks.

BY SUSAN BREIDENBACH

Outsourcing the day-to-day maintenance of your WAN can save money and free up your staff for important, strategic projects. Handing the planning and implementation of a WAN upgrade to a third party can be a lifesaver, especially if you're under a tight time frame or having trouble finding qualified staff.

And besides, managing a WAN is simply a thankless job. Your corporate management and end users expect instant access to resources anywhere in the world and show little or no appreciation for what you must do to enable this.

Despite these selling points, however, most U.S. companies are not buying managed WAN services. "In our last survey, only about 15% of the total had them," reports Melanie Posey, an analyst with International Data Corp. (IDC) in Framingham, Mass. Market researchers now concede that they overestimated the size of the market for managed network services and how fast it would grow. For example, only between 15% and 20% of all frame relay ports — the most popular type of managed WAN — are managed by third parties, according to IDC's latest estimate. IDC projects that the number will slowly creep up to only 25% in five years.



"You definitely need managed network services for international locations, but nationally the jury is still out," says Stephen Roberts, manager of network services at American Honda Motor Co.

DAVID BUTOW

Ellen Carney, principal analyst at Dataquest, says the largest companies are the most resistant to managed network services, while midsize companies below the Global 1000 are increasingly coming to the conclusion that the benefits of outsourcing their WANs outweigh the risks.

Analysts say the big bugaboo for large corporations is largely emotional — companies are afraid of losing control of their networks, Posey says.

"The biggest companies could benefit the most from managed network services (MNS), and they are the most reluctant to let go," she adds. Fortune 50 enterprises in particular seem determined to keep WAN management in-house, even though networking isn't their core competency.

Of course, fear of letting go isn't the only factor. Some network professionals are confused by all the permutations of managed services that are currently being hawked. Companies offering MNS range from local and long-distance telecom carriers to traditional outsource specialists such as EDS to service providers that don't own any wires but function more as brokers that give you a single point of contact.

Some MNS companies merely perform simple red light/green-light router monitoring. Others can provide custom-design services and comprehensive management of your premises, including moves, adds and

FIVE REASONS TO GO TO A MANAGED WAN:

ONE **Greenfield projects.** Don't even consider building a brand new WAN yourself.

TWO **Mergers and acquisitions.** Let a managed network provider that has done it before handle the network consolidat and subsequent operation.

THREE **Voice/data convergence.** If you are converging dedicated voice and data networks into a single infrastructur give serious consideration to outsourcing.

FOUR **Fast-growing multinationals.** As you move from country to country, there are too many differences among the service providers and their contracts, and you want to deal with just one.

FIVE **Unsophisticated user base.** The less technically savvy your users, the more it costs you to support them.

changes, and could even manage devices all the way to the desktop.

Claims about dramatic savings aren't particularly effective at larger shops, either, partly because most organizations don't have a clue how much it is costing them to run their networks. WAN management expenses disappear into a black hole of IT spending, and there is nothing to compare to the number in the service provider's proposal.

"Service providers are using a total cost of ownership pitch, but the numbers are oversimplified," Posey says. "People whose job functions got outsourced are shifted to other things and are still on the payroll, so the company just sees a big new expense — the outsource bill — and not any savings."

Plus, not everyone who tries a managed WAN has an entirely positive experience. American Honda Motor Co. in Torrance, Calif., decided last year to turn the management of its 65-site frame relay network over to Comdisco.

"Because of the problems we've run into in outage situations, we've had to take some of the router management back in-house," says Stephen Roberts, manager of network services for American Honda. "Right now, our response time internally is faster. Also, our staff understands our business objectives and network requirements better and are in a better position to assess implementation risks vs. value to the business."

American Honda's internal staff is responsible for network design, router configuration and software maintenance on network equipment. Comdisco oversees the physical wires — provisioning lines, adjusting committed information rates and port speeds, and troubleshooting circuit problems.

What type of relationship other companies should establish with managed services providers, if at all, depends on the size and scope of their networks and the internal resources they have, Roberts says. "You definitely need MNS for international locations, but nationally, the jury is still out."

DAVID BUTOW

"Our staff understands our business objectives and network requirements better and are in a better position to assess implementation risks vs. value to the business."

Stephen Roberts, manager of network services, American Honda Motor Co.

But many companies can't wait for the jury to finish its deliberations. They have to move quickly. Maritz, a $2 billion performance improvement and travel services company based in St. Louis, needed to upgrade a 10-site point-to-point network that was being managed by one person to a frame relay network to support a critical business application that was being deployed worldwide.

"I was one resignation away from implosion," says Gerry Imhoff, vice president of communications services for Maritz. He outsourced deployment and ongoing management of the WAN to Comdisco.

Continued on page 62

A BAKER'S DOZEN TIPS FOR SELECTING THE RIGHT MANAGED WAN PROVIDER:

ONE **Start with your existing service providers.** A logical place to start the selection process is with your existing service providers because they want to keep your business and, therefore, you have some leverage with them.

TWO **Try to match their strengths with your needs.** Some service providers may simply be promoting the offerings they happen to have in their portfolios. Make sure you aren't being force-fed a particular approach. You might be better served by a provider that lets you pick from a menu of services and vary the type and level of service in different locations on the WAN.

THREE **Ask about global coverage.** Worldwide coverage is another measure. The provider's geographic footprint should cover all locations you are likely to need in the foreseeable future — including secondary and tertiary markets.

FOUR **Try to maximize common locations.** Look for overlap between your locations and a provider's points of presence. The greater the overlap, the more the provider can reduce your access charges. And some providers deliver a particularly robust suite of global offerings for telecommuting, including dial-up IP remote access that doesn't rely on local ISPs.

FIVE **Look under the hood.** Because of all the mergers and acquisitions, some carrier infrastructures are a patchwork of regional networks connected by gateways. At some point, look under the hood and see if a service provider's network is as seamless as its marketing messages imply. Management information shouldn't be scattered across different spreadsheets and databases. And make sure all equipment is carrier-class, or the provider may have scalability problems.

SIX **Be sure equipment is compatible.** If you're handing off an existing network, you need to find a service provider that supports your equipment so you don't have to make a lot of changes. Some service providers have a small set of equipment they will monitor, and others can accommodate almost anything.

SEVEN **Check out polling intervals.** Polling intervals are very important, and they vary widely among providers. Some can poll your entire network every 90 seconds, while others might take 15 or 20 minutes.

EIGHT **The human factor.** No matter how good the service provider's physical network looks, it is a company's human infrastructure that really makes the difference. Find out how many certified engineers are on the staff and who does the installation and repair. Also, find out with whom you would be dealing when you have to call about a problem. Would you get a specific person who is intimately familiar with your network or a different person each time?

NINE **Get details on processes and procedures.** Make sure the service provider has proven methods and procedures in place for network implementation, problem escalation processes and change management. Ask to see process documentation — it should exist — and have the provider go through the steps with you.

TEN **Check out security.** Security is critical, and fears about it are one of the reasons companies give when asked why they aren't outsourcing their WANs. Do they let prospective customers, analysts and reporters wander through their operations center, or is security so tight it takes a retinal scan to get in.

ELEVEN **Ask for Web-based tools.** A service provider should be able to give you a Web-based tool that functions as a virtual network operation center and lets you log on and get read-only access from anywhere. The best tools let you see all components of your WAN, whether they belong to you or the service provider. And you should be able to look down into Layer 2 of a provider's network, not just Layer 3.

TWELVE **Think about who owns the fiber.** Service providers that own the fiber and copper they use claim that this gives them a distinct advantage. Wiring causes 90% of WAN problems, and the owners of the wire are closest to it. They can gather more statistics and get things fixed quickly.

Providers that don't own wire argue that when you hand management of your network over to a carrier who does, you have a fox watching the hen house. Those providers are measuring their own performance, so there is an inherent conflict of interest.

THIRTEEN **Use SLAs to judge a service provider's confidence.** The details of a service-level agreement (SLA) can tell you a lot about service providers and the performance levels to which they feel they can commit. SLAs need to focus on the availability of your network, not how quickly a problem gets reported. Make sure "response" doesn't just mean opening a trouble ticket, and be careful to distinguish between "restore" and "resolve." Restoring is a quick fix to get the network back up, while resolving involves changing things so the network doesn't go down again.

Reporting is an important part of SLAs — the type of reports you will get on the performance of your network, how often you will get them and in what format, and how readable they will be.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And analysts say Imhoff's staffing woes are not unusual. "I've been stunned by how lean the networking staffs at user organizations are," Dataquest's Carney says. "Our studies show that 80% of companies with $100 million or more in revenue have 10 or fewer people running their networks, and 75% have five or less."

In fact, the tight labor market may be the single biggest reason right now to outsource. Even if you do have the budget to pay the six-figure starting salaries for all the Cisco Certified Internetworking Engineers you need, there aren't enough to go around. There is simply no way you can match the pooled expertise and world-class talent that service providers have on their staffs.

Helena Chemical Co. in Memphis, Tenn., is another company that turned to outsourcing because it needed to move quickly and didn't have the staff to pull off a major WAN upgrade. The agrichemicals producer was replacing an old mainframe and AS/400 network as part of a Y2K project and needed a new WAN to connect its corporate headquarters, four manufacturing plants, 14 divisional offices and 210 retail stores spread across 48 states. A lot of the users are nontechnical types — people in remote locations who sell fertilizer, pesticides and seeds to farmers.

"It all had to happen very fast," says IT Director Stephen Kyriakos, who was in charge of the Y2K project. "Our management was looking at doing it internally, using tools like Tivoli, but I didn't hear anyone talking about a staff to use these tools. I had one network engineer on my staff, and Memphis doesn't have a big pool of frame relay and WAN experts to recruit from."

Demand on the WAN also fluctuates considerably because Helena Chemical makes most of its money during the spring planting season. Maintaining an internal staff year-round just to provide 24-7 support during these critical months is highly inefficient, so Helena Chemical turned to NetSolve. The new managed WAN went live this month, and Kyriakos is quite pleased.

"The outsourcing model works very well here and makes us very flexible," Kyriakos says. It also saves the company money while providing a higher level of service. "The original plan was to go with a dial-up network, which we would have had to manage in-house. I estimated the cost of this and the staff it would take, and it was more than what we are paying NetSolve for a dedicated network," he says.

"Our studies absolutely point to cost savings for companies that outsource MNS," says Yankee Group analyst Kitty Weldon. "We look at four different scenarios that show savings ranging from 20% to 53% — 56% in the case of a four- to five-year contract."

The tide starts to turn

Despite their misgivings, many network executives are beginning to realize that managed network services is a concept whose time is coming. Managing a WAN is difficult enough now, and growing network complexity is just going to make things worse.

"More of our clients are considering it now," Carney says. "And we are starting to come across venture capitalists who are telling clients, 'Don't spend money on building WANs — outsource them.' " Carney adds that she is also seeing an increasing number of government requests for bidders to run proposed networks, not just implement them.

Adds James Slaby, Giga senior industry analyst: "You need to keep your best and brightest people challenged and working on the most strategic projects, like the transformation to electronic business. These are scary new waters that people have to navigate, and they don't need the distraction of managing a WAN infrastructure."

Breidenbach is a consultant and freelance writer in San Mateo, Calif. She can be reached at SBreide@aol.com.

CHOOSING A TECHNOLOGY... OR NOT

Despite the superior convergence capabilities of ATM and the ubiquity of the Internet and IP, frame relay is still the core of the WAN and managed network services market.

And industry experts expect to continue to see growth in frame relay services.

However, one consequence of outsourcing is that customers are caring less and less whether their networks are running native IP, IP over ATM, IP over frame relay or whatever. "When you are just buying transport, you have to pick the technology," says John Gennaro, director of managed data services for Global One in Reston, Va. "But if you move into managed network services (MNS), it doesn't matter as much."

According to one school of thought, MNS companies have a relatively small window of opportunity. Virtual private networks (VPN) are going to take over, driven by the popularity of the Internet.

"You might see companies going from in-house WAN management to managed VPN services instead of managed WAN services," says Chris Carlson of Carlson Consulting Group, a network consultancy in Reston, Va. "It's very easy to see the cost savings with VPNs, while it's very fuzzy with MNS."

For now, VPNs are being offered largely by big ISPs, which are trying to position them as an alternative to managed network services.

MNS providers almost unanimously say that VPNs aren't ready for prime time. Because they run over the public Internet, VPNs aren't as inherently secure as dedicated frame relay networks, and they don't yet offer built-in quality of service for applications that need guaranteed latency levels.

However, if your performance predictability requirements are relatively low, you should consider a managed VPN, because it is much cheaper than MNS.

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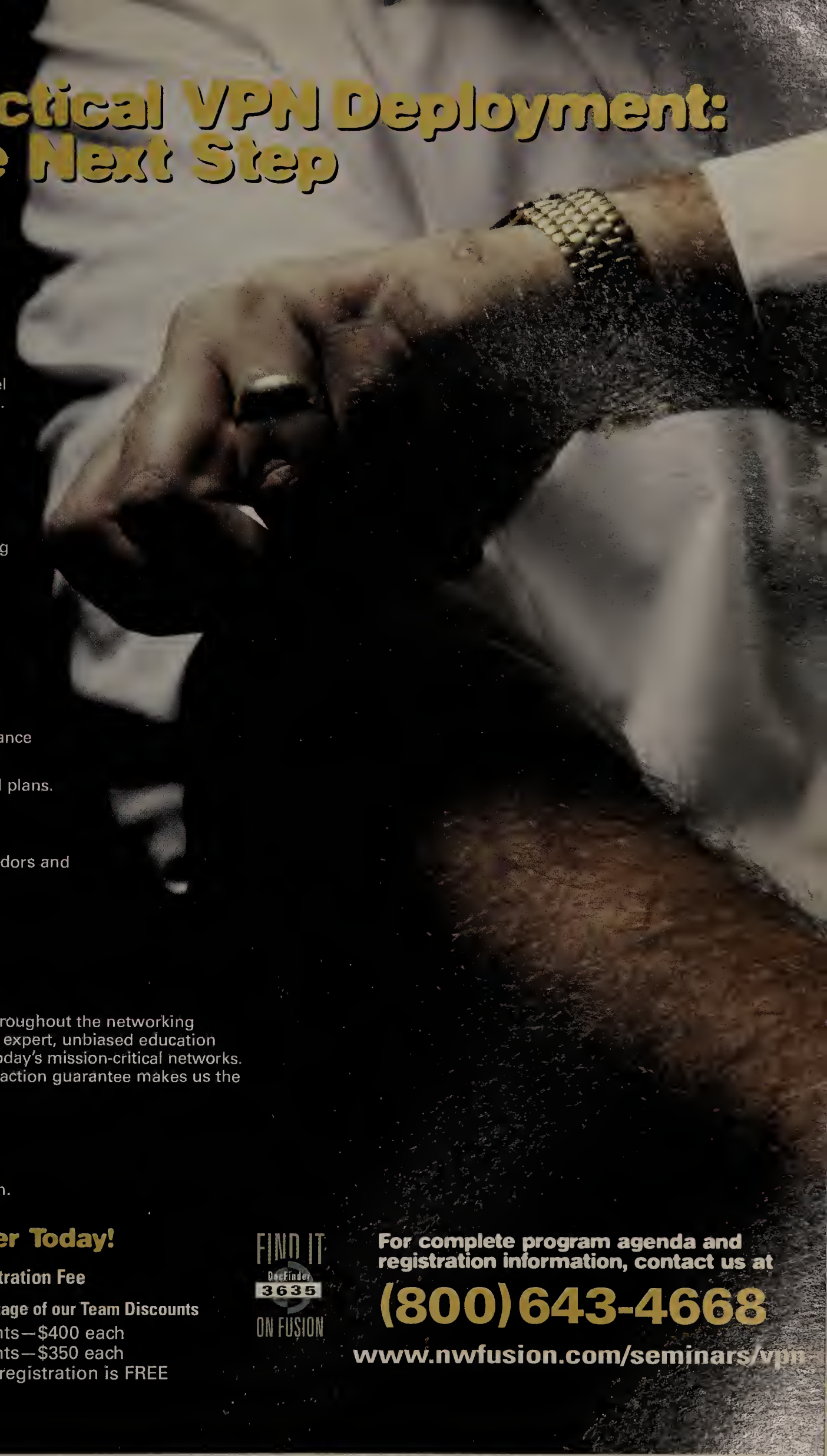

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Feature

EVENT CORRELATION from myth to reality

ALLEN CRAWFORD/PLANKTON ART CO

BY ROBERT FREITAS

In a darkened network operations center, operators and engineers mill about, performing their routine morning rituals, drinking coffee, reading e-mails and checking log files.

A large display dominates the scene, providing a topology map that changes color with the status of each node. An idle event browser is displayed next to the map. All of a sudden, the event browser goes berserk, scrolling faster than the human eye can follow; the map turns a solid red, and the phones start ringing nonstop.

The operators spring into action, frantically banging away on every available keyboard in an effort to determine what went wrong. The operations manager bursts in and bellows, "What's going on?" The lead operator barks back, "We don't know yet, we're working on it."

In exasperation, the manager looks up at the ceiling, sighs deeply and asks, "Why can't I just get a tool that tells me what's wrong?" The operator hunches back toward his console and whispers to himself, "That's a myth, boss, that's a myth."

This scenario is played out on a daily basis in corporations that increasingly rely upon their networks to provide business services. However, it doesn't have to be like this. Event correlation is not a myth.

Sophisticated network management technologies are available today that do, in fact, provide network managers with the ability to pinpoint the source of network problems. However, selecting the right products, getting them to work together and configuring them properly is a daunting task.

The first step is to understand how event correlation works. An effective event correlation system is built upon three levels:

1. **The object level,** which focuses on isolating problems specific to a particular device.
2. **The network level,** which focuses on how nodes in the network are connected to each other and the impact each node has on its neighbors.
3. **The service level,** which is concerned with applications that use the network and how failures at the object, network and/or service levels impact the performance of a particular service.

Most organizations do not achieve effective event correlation because they are unable to establish the relationships among these three levels.

Object level

At the object level, conditions are monitored on an individual object, and information is processed to isolate the root cause of a problem pertaining only to that object (or node in the network).

When a problem occurs, the event correlation engine (ECE) needs to ask a complex set of questions, the answers to which eventually lead to a problem determination.

For example, let's say a router generates an SNMP trap, informing the ECE that an interface has just gone down. The ECE needs to verify some base level information — that the interface is really down and that it's not supposed to be down. Then the ECE will start asking additional questions. Are the I/O buffers overflowing? If so, is CPU utilization maxed out? From these pieces of information and an intimate knowledge of the network, the problem can be identified — the router is overutilized and needs to be upgraded.

Network level

The network level is concerned with how nodes are related to each other and how the failure of one (or more) node will affect the rest of the network. This needs to be done by examining the connections between the nodes and con-

structing a database of these connections. The idea is to determine a set of parent/child relationships to every node being monitored. Naturally, this will be a many-to-many relationship because nodes could have multiple children and multiple parents. With this information, the complete path to any node can be known, and it will be possible to recognize that a large stream of alarms are the result of a single node.

At first blush, it may seem that this information is available in the topology map. However, topology maps can miss things such as alternate routes to or from a router, multiple IP addresses associated with a single router, and Hot Standby Routing Protocol, where two routers act as one.

Be very wary of off-the-shelf software packages that claim to do everything without needing any maintenance.

The only effective method of overcoming these shortcomings is to start with the topology information and then refine it by retrieving additional information. The four ways to do that are:

1. Retrieve the information from the router/switch configurations.
2. Develop scripts or programs to access the command-line interface.
3. Leverage existing databases (if they exist).
4. Manually populate the database from existing network documentation.

Service level

At the service level or application level, problems are not really problems at all; they are symptoms of some other problem, the failure of a node (at the object level) or a connection (at the network level) or a subordinate service such as Domain Name System (at the service level).

The ECE needs to recognize that a service has failed and then map the symptom to the actual problem. Knowing the logical relationships and the dependencies among the various network nodes is the key at the service level. Unfortunately, each service is unique and can have a complicated set of dependencies.

There are tools that can help, such as Application Scanner from Ganymede Software. Realistically, the process of finding all the relationships will be an iterative one.

After determining the dependencies, it will then be possible to use tools to measure the performance of the service. There are three basic approaches to measuring application performance:

1. Use simulated transactions.
2. Use agents on every user desktop.
3. Use agents on the servers.

Here's how an event correlation engine would work at the service level: Let's assume that an interface is down, and suppose the marketing department has negotiated a 10-second response time for each Web page to be displayed. And let's assume that the Web server makes SQL queries to a Sybase server, which happens to be on the other side of the failed interface.

The ECE needs to notice that the Web page has not been displayed in the 10-second window, then needs to check through the dependencies, discover that the Web server is dependent upon a Sybase database, and that the Sybase server is unavailable because the link is down.

Without accurate relationship information, the ECE would be unable to diagnose the problem.

Putting it all together

Here's what you need to deploy event correlation:

1. Whether it's autodiscovery with a management platform, such as Network Node Manager or NetView 6000, or a manually populated database, there needs to be some way for node information to be added, deleted, and modified. Accurate node information is the mortar and stone of the network management system.

2. Next, there needs to be an ECE. From the conceptual point of view, this is a nebulous thing where event information goes in, gets processed and out pops the root cause of the problem. In reality, it will more than likely be a set of tools working closely together.

3. There needs to be some method of notification. The typical notifications would be to technical support staff or end users, and would take the form of e-mails, pages, events in a browser, sirens, flashing lights or all of the above. There also needs to be a tool-to-tool notification, which would be SNMP traps or User Data Protocol (UDP)/TCP socket connections.

4. The network management system should be divided into components that perform particular tasks. At the top of the system would be the Manager of Managers (MOM). The MOM will receive alarm information; consolidate the information; and provide an enterprise level view of the alarm conditions. More importantly, this will be where the service-level relationship database is maintained and used. The MOM has the big picture and is best-suited to perform the service-level correlation. There are a number of tools available today that can fill this role, such as Micromuse NetCool, Tivoli Event Console or Boole & Babbage Command Post.

5. In a typical enterprise network, there will be at least three ECEs feeding the MOM with alarm information. Each needs to be customized with models for the nodes that it manages. Each is responsible for one layer of the network infrastructure, one for the backbone, one for the routers/switches and one for the servers. Examples of ECEs available today include Veritas' NerveCenter and SMARTS' InCharge.

Some additional tips

Be very wary of off-the-shelf software packages that claim to do everything without needing any maintenance. These may provide a quick solution, but they may not provide the advanced functionality needed for the long-term.

In addition, these "do-it-all" products tend to lock the solution into one technology base, and as the technology solution gets bigger and bigger, the development cycle gets slower and slower. Generally speaking, the highest-quality functionality with the quickest turnaround time will be achieved by integrating best-of-breed, point products.

Establishing the relationships is the key to success, and maintaining the relationships requires a database. However, don't overengineer the database. Do not attempt to make it into more than it needs to be. Keep it as simple as possible. It could a relational SQL database, or it could be a simple flat file or anything in between. Do not allow the database to become a stumbling block.

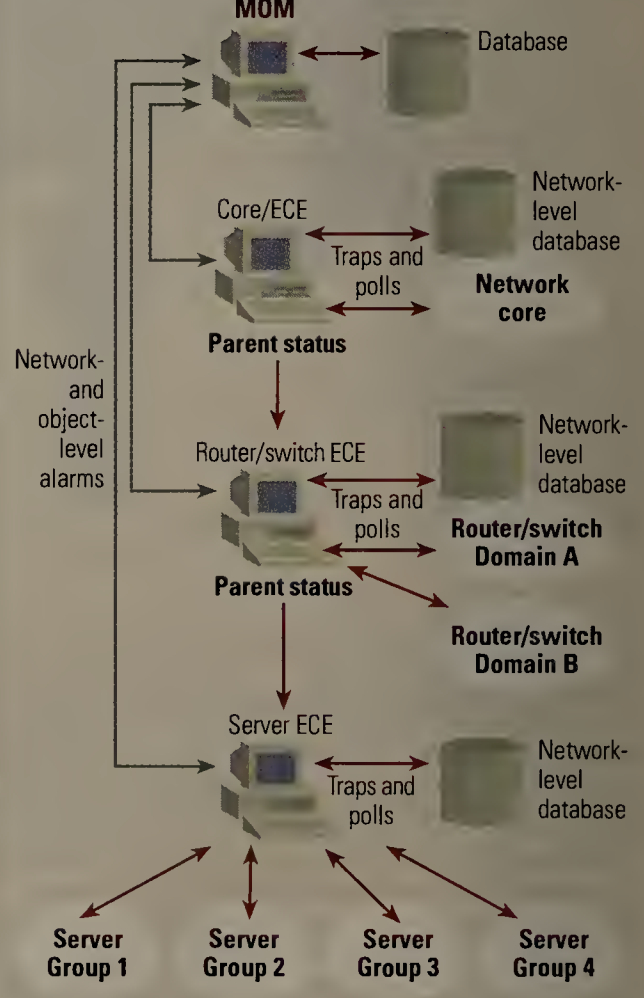
Customization is another key factor in long-term success. Ensure that the selected products are customizable, especially when it comes to the models. It is paramount that models can be customized and enhanced to match a specific series of events. Each network is unique, complete with its own set of quirks. A generic model may provide a good template, but it will almost always need to be adjusted for subtle nuances.

Finally, learn how to crawl before trying to walk, and learn to walk before trying to run. It would be a serious mistake to attempt the service-level correlation before first conquering object-level and then network-level correlation. These are the foundation on which the house is built, and without them, the structure will surely crumble.

Robert Freitas is a network consultant and president of Freitas Consulting, in San Ramon, Calif. He can be reached at rfreitas@freitasconsulting.com.

Event of the season

At the top of the event correlation hierarchy is the Manager of Managers (MOM). The MOM will receive alarm information from the other components of the system. It consolidates the information and provides an enterprise-level view of the alarm conditions. More importantly, this will be where the service-level relationship database is maintained and used. The MOM has the big picture and is best-suited to perform service-level correlation.



There will be at least three Event Correlation Engines (ECE). Each is responsible for one layer of the network infrastructure, one for the network core, one for the routers/switches and one for the servers. This setup provides a natural progression of dependency information. The servers are dependent upon the routers and switches for their connectivity. The routers and switches are dependent upon the network core for their connectivity.

NetworkWorld
REVIEW
Network Management

Diagnosing network damage

SMARTS InCharge Switch Connectivity Manager roots out network ills so you can cure the right disease.

BY JEFFREY FRITZ

Network management packages alert you when a network problem arises. That's helpful, but sometimes the information they provide can be a bit overwhelming. When a network device fails, all the devices behind the failed device indicate failure. Often finding the real source of the problem can take as long as correcting the fault itself.

Enter InCharge Switch Connectivity Manager (SCM) 3.0 by System Management ARTS (SMARTS). SCM is a network management package that can pin connectivity problems in switched networks right down to specific switch, port and trunk failures.

Instead of issuing multiple alarms, many of which simply reflect a failure further up the chain, SCM attempts to pinpoint the actual device that failed. To do this, SCM compares observed network events to problems listed in its Codebook. The Codebook matches network alarms to known problems. Because it does this in real time, SCM can make intelligent and timely decisions as to where the network problem originated.

SCM consists of a server application that monitors the status of network devices, a broker that coordinates servers in multiple InCharge server environments, and a Java-based console. Server output can be directed to HP OpenView and IBM NetView management platforms and SNMP workstations. In addition, SCM supports Remedy's Help Desk system and Tivoli's Enterprise Console.

SCM is one of a suite of applications built upon the InCharge platform. It runs on Solaris 2.5 or above, HP-UX 10.2 or above, Windows NT 4.0 and AIX 4.2.1 or above.

Each network device that SCM monitors must be qualified by SMARTS. Device qualification provides SCM with knowledge of the internal configuration of network devices, including interface cards, ports and modules. Failure detection will occur whether the device is qualified or not, but the more SCM knows about the specific devices on the network, the more it can report regarding anomalies and failures.

Fortunately, SCM comes with a large list of qualified devices from network vendors. That means you will rarely have to have a network device specially qualified. Still, if the SMARTS installation crew stumbles upon an unqualified device, it does an SNMP walk to discover the device parameters and sends the output back to SMARTS' engineering department for analysis and qualification.

Most of the devices on our network were known, but many of the ATM modules in our Cisco switches were unqualified. According to SMARTS, the device qualification process takes a week or so, but in our case, possibly because the product was still new, the qualification process took considerably longer. Once a device is certified for one user, it is certified for all users and available in the form of software updates that are free to all customers holding maintenance contracts with SMARTS.

To accurately report failures, SCM also needs to understand the network topology. During installation you need to provide the program with a seed file containing a list of device addresses. SCM uses the addresses to identify the various network devices, their attributes, and their relationships with other devices, including their role in the spanning tree and virtual LANs. SCM only looks at the seed file when it starts or when you tell it to from the graphical user interface (GUI) menu.

We think the idea of a seed file is both bad and good. It would be nice if SCM did better with autodiscovery and it wasn't necessary to create a seed file in the first place. But on the other hand, sometimes all the network equipment in a large enterprise network is not controlled centrally, so being able to exclude certain devices by not placing them in the seed file is a plus. You can manage new devices at any time simply by using a text editor to list them in the seed file and telling SCM to rediscover the network.

What is true of a network today does not necessarily apply tomorrow. Therefore SCM attempts to adapt to topology changes in the network. By default, the SCM server sweeps the network every six hours looking for topology changes.

To see how well SCM could find and report failures, we generated seven random failures in our test network. Some were simple single failures, such as a link being disconnected. Others were more complex, involving several failures, such as switch modules being downed while links were also pulled. In every case, SCM was able to diagnose and resolve the problem we tossed at it within three minutes. In many cases, it was able to finger the problem in less than 45 seconds. Usually, this is a quick enough response time to avert a total network catastrophe. (Check www.nwfusion.com, DocFinder: 5223, for complete test results.)

The faults show up in an Excel-like table in the console program with each status report showing as a row in the table. Some of the error descriptions are wordy and flow off the end of the screen, requiring you to scroll through the table to read the descriptions. Reporting problems in a table makes sense, but there must be better ways of communicating this information to the user.

ScoreCard

InCharge Switch Connectivity Manager 3.0

Discovery 30%	7
Features 30%	8
Reporting 20%	8
Documentation 10%	4
Installation 10%	9
Total Score	7.4

Individual category scores are based on a scale of 1 to 10. Percentages are the weight given each category in determining the total score.

SCM can alert network managers to trouble on the network in the form of e-mail, page or a fax. Additionally, the product can generate a trouble ticket or evoke a script that will take action to correct the problem.

Most of the time SCM's analysis was right. It diagnosed five out of the seven failures correctly.

However, SCM wasn't perfect. For example, SCM correctly reported a link outage caused by shutting down port 11 on the Local_D switch. While it found the right connection, it flagged the other switch at the end of the link (Local_A) as the culprit. This was strange because the connection was redundant and there was still a live connection to the switch.

In another case, SCM correctly reported switch LAB_C was out of service (because it was completely disconnected from the network). It accurately reported two disconnected 56K bit/sec serial links. However, SCM neglected to report that the Ethernet interface on the same switch was also down. This was an oversight, because all three ports on that switch had been disconnected.

Getting started with SCM is as simple as using the application. Under NT, SCM installs like a typical NT application, so you could install it yourself. However, because parts

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Pros

- ▲ Effective and rapid reporting of outages down to the switch port and link level
- ▲ Most of the time, the problem is pinpointed correctly

Cons

- ▼ Expensive
- ▼ Sometimes overlooks problems in the network
- ▼ Documentation could be better

of the installation are complex, SMARTS includes on-site installation for its customers at no extra charge, and we recommend letting the company handle the entire installation. A full installation of the NT product consumed 30M bytes on our hard drive and took about half of the day.

While SMARTS did a fine job on the installation, we found the company's written documentation lacking. Perhaps this is because the product, which came out over the summer, was new during our test. Much of the photocopied documentation we received was skimpy, and we were unable to find an index in any of the documentation, something sorely needed in a product this robust.

SCM is definitely not a solution for an organization that intends to hire a couple of teenagers to run the network after school. Although its GUI is easy to understand and logically laid out, the package requires a decent understanding of SNMP and Management Information Bases to properly interpret the information presented in the alarms. As we have seen, SCM does not hit the mark every time in its analysis.

SCM is a sophisticated program that is powerful but also pricey. The package starts at $25,000 for 1,000 managed switch ports and increases in price from there. However, if you've got network operators who have good knowledge of the network they are managing, SCM can be an invaluable aid for keeping the network running.

Fritz is the principal network engineer for West Virginia University. He is also the author of Remote LAN Access: A Guide for Networkers and the Rest of Us. *He can be reached at jfritz@wvu.edu.* *Fritz thanks lab test team members Floyd Roberts, Ralph Chapman, Matt Glotfelty, John Bird Vilseck, Ian Hutzel and Ed Leatherman for their assistance, and Compaq for the loan of the Compaq ProLiant 3000 server.*

How we did it

We created a test network consisting of four Cisco switches and six Cisco routers, with connections over Ethernet, Fast Ethernet and simulated 56K bit/sec High Level Data Control links.

We assigned two workstations running Windows NT Workstation 4 and Service Pack 5 to host the SCM broker and client software. We ran the In Charge SCM server software on a Compaq ProLiant 3000 server with NT 4.0 Server and Service Pack 5.

Prior to testing, we created a seed file with the IP addresses and SNMP community strings for the devices we wanted to discover. In our case, we wanted to discover and manage every device in the network except for a single Cisco 1900 switch.

After the SCM completed reading in the seed file and discovering devices, we divided our test crew in half. Crew A operated the SCM console while Crew B generated a series of random failures in the network.

We allowed SCM enough time to resolve an error to as close to 100% probability as it could get. We then compared the failures suggested by SCM with the actual failures we had caused.

More details on our test bed can be found at www.nwfusion.com, DocFinder: 5223.

Management Strategies

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Certification programs teach IT and business professionals the skills they need to succeed online.

BY TONY KONTZER

John Sturm may be the ideal poster child for the Internet economy. Until recently, Sturm was the director of advertising for HEB Grocery, a San Antonio, Texas-based food and drug retailer with 260 stores in Louisiana, Texas and Mexico. But in preparation for the relaunch of its Web site, HEB in July named Sturm director and general manager of heb.com.

Suddenly, Sturm found himself heading HEB's effort to capitalize on its Internet presence. That meant he needed to supplement his sales and marketing background with some basic knowledge of network and Web technologies.

By taking courses in HTML, Web site planning requirements and media design through HyCurve, a San Francisco firm that offers accredited, Internet-related certification, Sturm was able to develop a more authoritative view of HEB's Web pursuits.

"It helped me understand the technology better," he says. "Now, when I analyze our competitors' sites, I know exactly what they're doing."

In fact, Sturm is so convinced by the effectiveness of the HyCurve curriculum that he intends to have members of his Web team go through at least one of HyCurve's four advanced tracks — security, design, programming and administration.

Sturm and HyCurve are a reflection of corporate America's rush to use the Internet to connect with customers, suppliers, employees and partners.

Unprecedented demand for people with a combination of technical, business and creative skills that translate to the Internet has resulted in a growing base of knowledge-hungry professionals being served by a similarly expanding assortment of certification programs.

John Sturm hopes HEB Grocery's online strategy proves fruitful.

MPG

And while Sturm is a marketer with polished business skills who sought some IT training, large numbers of IT professionals also are turning to certification programs to develop the business skills needed to become electronic commerce experts.

According to Andrew Kraft, executive director of the Association of Internet Professionals (AIP), the demand for e-business certification has grown so quickly that some programs — most no more than one year old — already are emerging as the cream of the crop. AIP has accredited a handful of such programs, including ones from HyCurve, Microsoft and Novell.

"Getting a certification in many ways is about branding yourself," Kraft says. In other words, it's not just what you know, but where you learned it. IBM, which has attempted to portray itself as an e-business leader, this summer jumped on the certification bandwagon and released its own program. The curriculum is intended to help IBM's partners harness the company's e-business products, services and technologies.

IBM reseller Mainline Information Systems has invested more than $250,000 to put at least 60 people through the program. Nearly half of those are IT professionals being certified as solution designers, with coursework focusing on evaluating and implementing technologies and using open standards for e-business. The rest are salespeople obtaining certification as e-business advisors, gaining skills related to vision, strategy and deployment plans. Marty Besley, vice president of worldwide sales and marketing for Mainline, says recent customer feedback convinced him of one key reality: Having IT staffers who were more adept in e-business and salespeople who had a better understanding of IT technologies was crucial to the firm's continued success.

"It's no longer 'here's how to make a pretty Web page,'" Besley says. "It's 'here's how you re-engineer your business.' " Of course, Besley admits that there is a potential downside for employers who pay for employees to be certified. While employers benefit from the valuable skills the employees learn, certification also may fuel employee turnover.

HyCurve CEO Carolyn Rose says that's a shortsighted view, and that investing in their professional development actually increases employees' loyalty. But Rose acknowledges that it's also a real risk.

"They come out with incredibly marketable skills," Rose says of her program's students. "They can write their own ticket in many respects."

Kontzer is a freelance writer in San Jose. He can be reached at tony@goodink.com.

Do your homework

Andrew Kraft, executive director of the Association of Internet Professionals (AIP), offers these tips for selecting an e-commerce certification program:

- Check the AIP Web site at www.accredit.net to see which programs offer what you need.
- Look for a program that is accredited by the AIP.
- Once you've narrowed your list to six or seven prospects, zero in on the programs that offer additional features that might be of use, such as instruction on basic network or general business knowledge.

More online:

- E-commerce on college campuses.
- Information about certification programs.

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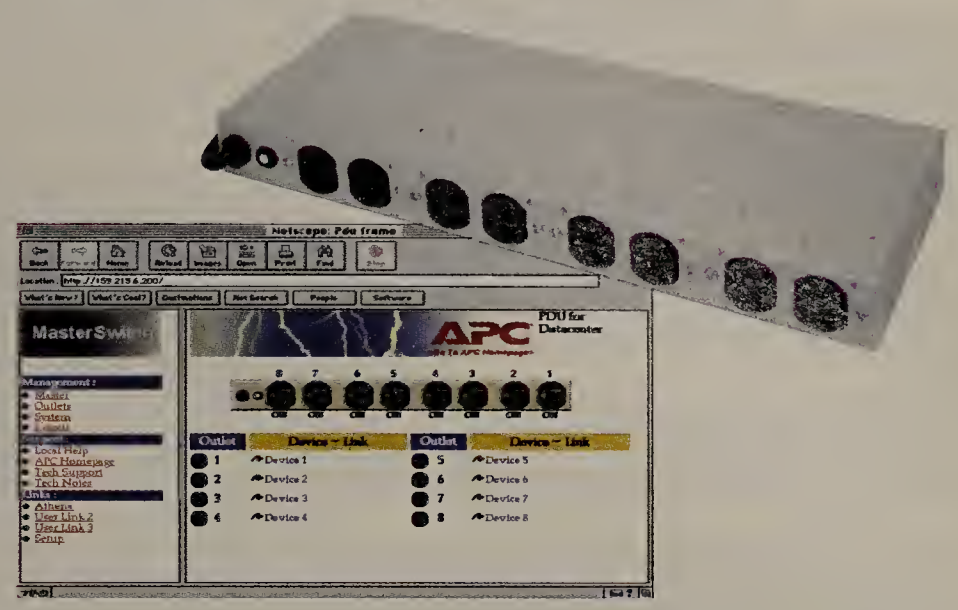

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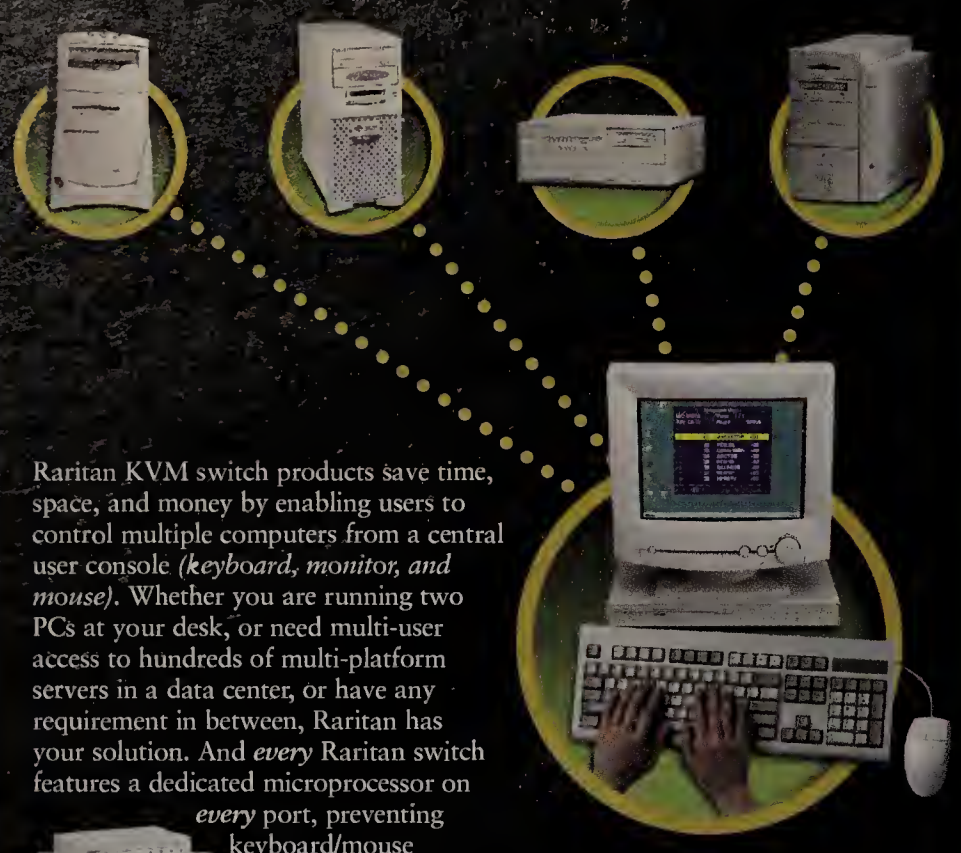

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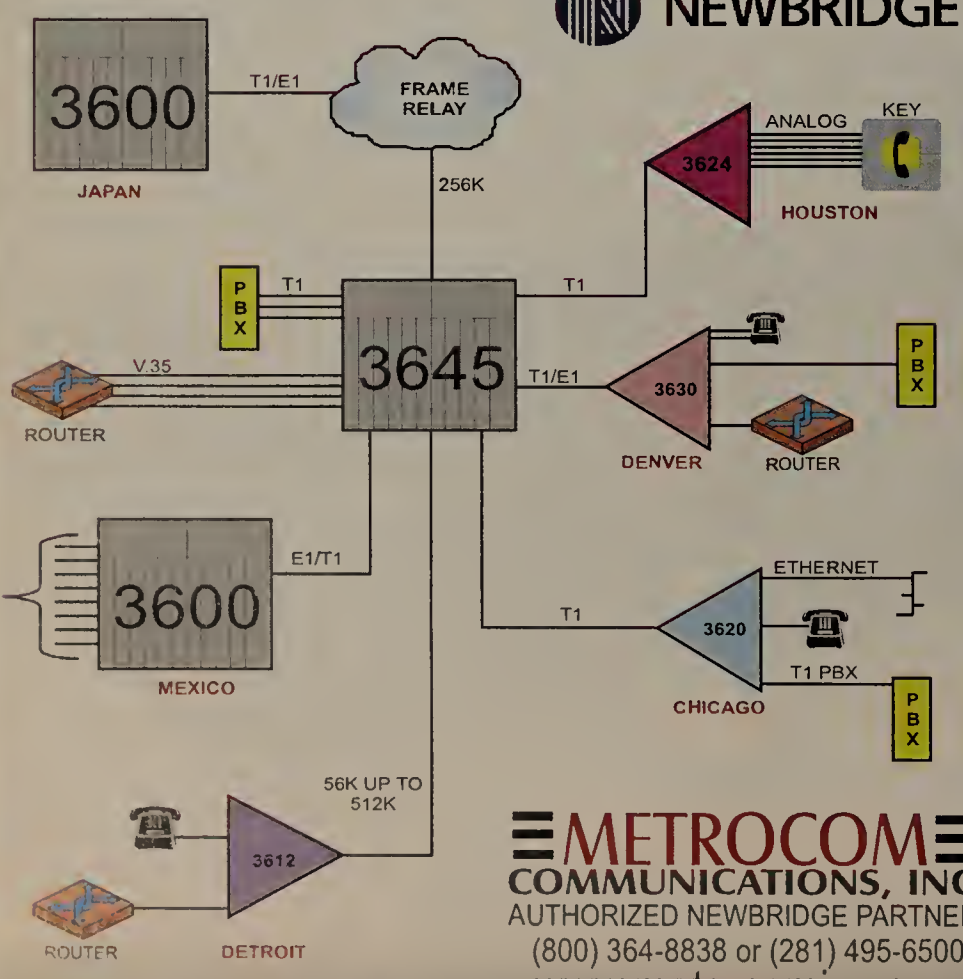

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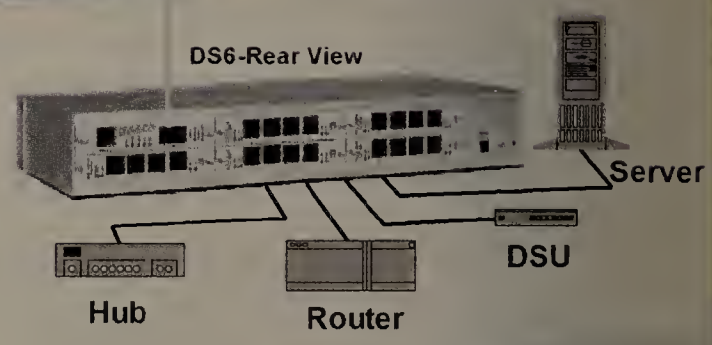

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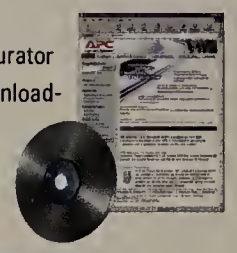

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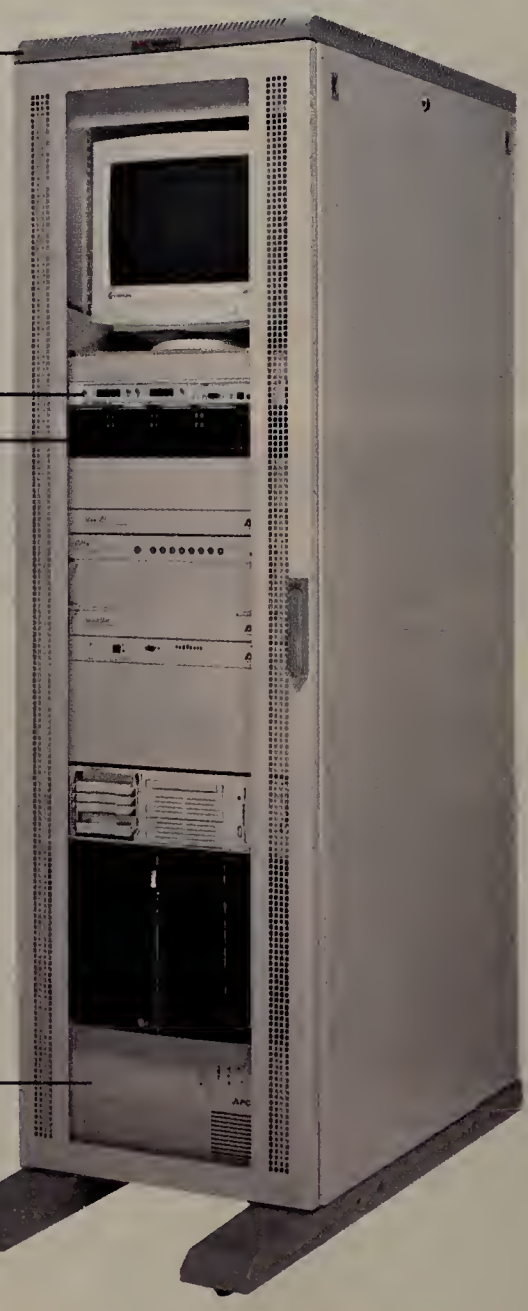

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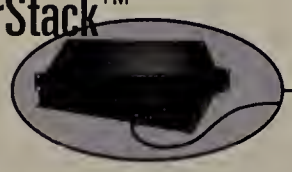

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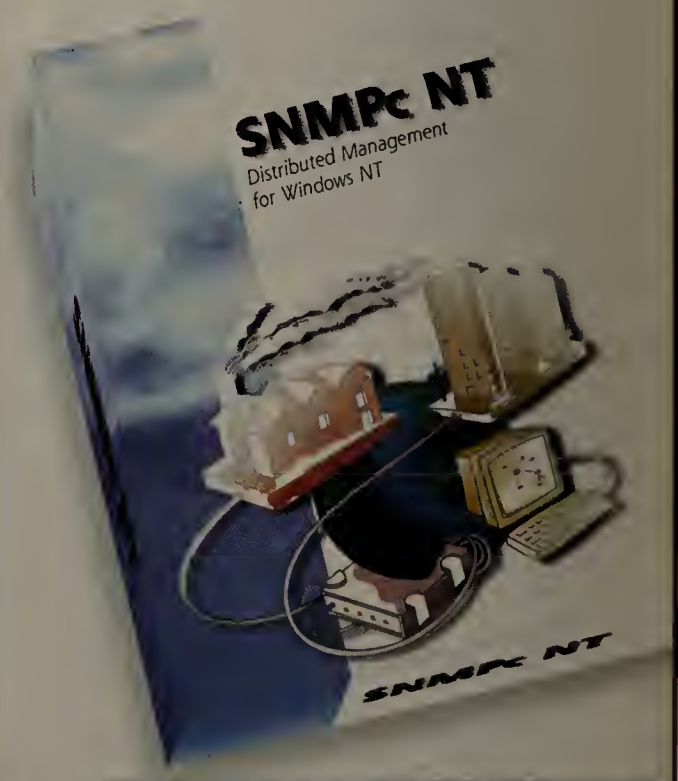

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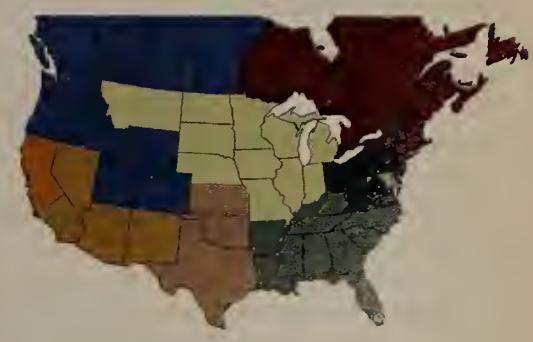

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CPN
continued from page 1

But most enterprise net customers couldn't care less about the equipment their service providers use to deliver voice over IP, Web hosting, application processing or other offerings. Indeed, Cisco conducted its own internal survey on the impact of the CPN program and found that less than half of the enterprises queried would select to do business with a CPN service provider vs. a non-CPN company.

"It means more to me what their uptime and strength of the network is than that it happens to be Cisco [powered]," says Todd Dion, vice president of technology at Tutor Time, a high-tech child care company in West Palm Beach, Fla., that uses Cisco gear. "CPN doesn't butter my toast that much."

"We go through a request for proposal process that looks at several things — price and performance, and this, that and the other — but there's nothing saying we're looking for Cisco certification with our ISP," says Roger Graves, systems analyst at the State of Mississippi in Jackson, which is another Cisco customer.

NuSkin Enterprises, a Cisco customer based in Utah, also considers CPN certification to be a low-priority item when considering a service provider.

"I don't know if we're picking any ISPs just for that reason," says James Frary, NuSkin's senior network architect. "We'd pick them for a lot of other reasons — size, reliability, all the other junk."

On the other hand, Grey Zone Productions, a Web development company in Capitola, Calif., says CPN certification was important in its decision to continue doing business with service provider Digital Island. But Grey Zone was in desperate straits when it selected Digital Island a year ago.

Grey Zone had its servers located in the data center of service provider Vaultline when Vaultline notified Grey Zone and other customers that they had five hours to remove their equipment because the service provider was going out of business. Digital Island stepped in and snapped up Vaultline's customers, including Grey Zone.

Grey Zone executives admit that had Digital Island not been a CPN service provider, it would not have busted the deal. But they say CPN has kept them in the Digital Island fold since the Vaultline predicament.

"There was nothing that was going to keep me from going to Digital Island, but the question was do I stay for a week or do I stay long-term," says Daniel Duerr, Grey Zone's founder and president. "Here we are a year later and we never even thought twice about leaving."

But even CPN service providers say the program has done little to directly open up new sales opportunities to enterprise net customers. Enterprise customers do not demand or request CPN certification when evaluating service provider offerings, participants say, nor is there a tangible benefit of the CPN program for enterprises.

This is in contrast to Cisco's initial objective with the program, which was to enable Cisco's enterprise customers to select service providers that had the company's equipment in their infrastructure, according to Outcalt.

"There's no hard data on direct sales wins," says Mark Jaffe, chief operating officer at Globix in New York. "But indirectly, being an organization that uses exclusively Cisco gear across our backbone has allowed us to win a lot of streaming business because clients know we have the ability to multicast."

Having a Cisco network enabled Globix to win business with MSNBC, Microsoft and the House of Blues. The CPN designation did not make a difference, he says.

"Having the name Cisco in there would lead to the conversation on multicasting, but I can't tell you [the business opportunity] was a direct result of the CPN program," Jaffe says.

NaviSite, an application service provider in suburban Boston, can't point to new customer opportunities from the CPN program but expects some to emerge.

"CPN members get a lot of visibility from being on the Cisco Web site," says Jay Seaton, NaviSite's vice president of marketing. "That would lead to people who would not have seen us otherwise. Hopefully, that would lead to some business."

Seaton says CPN gives enterprises the indirect benefit of knowing that their service provider's network is based on the same equipment in the enterprise backbone.

"To the degree that they equate that with quality and dependability, it gives us that association," Seaton says.

Small and midsize enterprises care more about service-level agreements (SLA) and end-to-end quality of service than CPN certification, says David Kim, vice president of Internet technologies at IXC. But the service provider touts the CPN designation to larger enterprises because they're most likely to be Cisco shops anyway.

"In the [small to midsize] arena, we're finding that CPN is not as critical, but Cisco is putting a lot of effort into [that area] because they see that as the largest opportunity and the growth area," Kim says. "They've already captured the large enterprise."

These views corroborate a brand tracking study Cisco commissioned this year that found that less than half of the 206 enterprises surveyed would be more likely to use an ISP certified by Cisco than one that is not. Outcalt, though, says the findings of this study actually exceeded Cisco's expectations.

Other service providers say sales lead generation was never the intent behind the CPN program, an assertion Outcalt concurs with. They say it serves more to break down the initial barriers between service providers and enterprises via familiarity with the equipment used in each network.

"If you're CPN certified, it's almost a check in the box," says Jim Crowder, vice president of strategic development at Enron. "That means you've got compatibility, you've met certain standards and you're going to remove some of the variables involved in meeting quality-of-service commitments and delivering on SLA commitments."

CPN helps foster peering relationships between service providers, says Jackie Vanderbrug, vice president of business development at iBasis in suburban Boston. IBasis was able to establish peering arrangements with a European service provider and with ICG in the U.S., thanks to the CPN program, she says.

"Given the state of interoperability in our business, it's very difficult to work across platforms," Vanderbrug says. "[With CPN] we know immediately that we don't have interoperability issues. 'We can work with you, let's exchange traffic.'"

Sales leads "weren't one of the specific goals, but they are one of the attributes of the program," Outcalt says.

Despite the indifference of enterprise customers, the CPN program has nonetheless been successful from service providers' and Cisco's standpoint.

To date there are 179 CPN service providers in 23 countries, less than half of which are in the United States, Outcalt says.

"It's ahead of pace of what we had projected, so it's considered a very successful program in Cisco," he says.

But CPN is much more than a joint marketing program. In return for equipping 80% to 85% of their service infrastructure with Cisco gear, service providers not only get to flash the Cisco logo in their marketing campaigns, but they can also tap Cisco funding for those campaigns and receive technical assistance from the data giant for creating and rolling out new services.

Indeed, the CPN program has expanded over the past two years from one that is branding-focused to one that is focused on establishing business partnerships, Outcalt says.

Not a big deal

According to a Cisco survey of 206 enterprise users, nearly 60% said they did not care if their ISPs were Cisco-certified.

Are you more likely to use an ISP certified by Cisco than one that is not?

SOURCE CISCO

ALLEN WEINER

"They help engineer and oversee our network, and stand behind it if there's a problem," says Ignatius Leonard, president of Caprock, a service provider based in Texas that just signed up for the CPN program. "Cisco had a lot to say in how that network was put together. For me, that was very important."

Indeed, one of the criteria for CPN certification is for the service provider to demonstrate "industry leading levels" of service quality and customer satisfaction, according to Cisco. Some service providers say Cisco does not strictly enforce these criteria, but then again, the company has never been in a position where it needs to be enforced.

"Cisco has been instrumental in the architecture of our environment here," says Bobby Patrick, vice president of strategy and marketing for Digex. "Our requirements are absolutely 100% availability at all times. If they have CPN qualification limits, I'm sure we don't know about them because we are doing it."

"One of the reasons we have our [Cisco account] rep on-site is to help understand what's going on and what we're doing from a design standpoint, and give us the best solution possible," says Jim Wilson, director of Internet alliances at Frontier Globalcenter. "They know that the network is right. They do monitor it from that standpoint, but I'm not aware really of any kind of performance metrics in terms of our quality of service that they're gauging right now."

Cisco has two ways to measure service quality, Outcalt says. One is requiring the service provider to measure and publish their network quality data; the other is feedback from enterprise customers on how satisfied they are with their CPN service.

"We've never had to use that" in determining whether a service provider was fulfilling its CPN obligation, Outcalt says. Cisco reviews CPN service quality and customer satisfaction annually, he says.

The only reasons Cisco had to rescind CPN membership from some service providers was because their Cisco equipment content fell below the 85% requirement or they were acquired, he says.

And then there are those Cisco service provider customers who choose not to participate in the CPN program. HarvardNet in Cambridge, Mass., and MindSpring in Atlanta are two such service providers. For them, the benefits of the CPN program did not warrant the time and trouble to swap out non-Cisco gear to reach the 85% Cisco-equipped requirement.

"We have a philosophy of using the best equipment or product for the job rather than putting all of our eggs in one vendor's basket," says Brandon Ross, director of network engineering at MindSpring. "After all, that's what internetworking is all about."

That works both ways, though. Cisco's Outcalt says there are some service providers that have ditched their non-Cisco equipment in order to gain CPN status.

Analysts also say the CPN program has been a marketing success for Cisco and the CPN service providers. But going forward, as services and the enterprises that buy them become more sophisticated, Cisco will need to work more closely with CPN partners on network integration rather than just marketing.

Cisco can only live off of its good name for so long, analysts say. CPN must stand for unique, reliable and value-added services and network engineering, rather than a network that's merely built with Cisco products.

"As all of these services [focus on] having flow-through provisioning and more intelligent customer network management, Cisco is going to have to evolve the definition [of CPN] to be a little more rigorous," says Joe Baylock, an analyst at Gartner Group.

The CPN program has to support more fully defined services in terms of how enterprise customers order them, how the services are managed and provisioned and how they perform, he says. ◪

Start-up's fiber gear could slash T-1 prices

BY TIM GREENE

NORTH ANDOVER, MASS. — Start-up Quantum Bridge is readying equipment that could enable carriers to deliver T-1 lines over fiber optic lines for half the price of typical T-1s.

By eliminating the need for expensive electronics on the fiber that runs from the service provider network to customer sites, Quantum Bridge cuts carrier equipment costs 90% — enough to bring about dramatic price cuts, says Tony Zona, Quantum Bridge's CEO.

Using his company's equipment, carriers should be able to offer T-1s for $300 per month and still be able to pay off the Quantum Bridge gear within 18 months, he says.

The alternative to the company's passive optical networking technology is SONET, a technology Zona and Quantum Bridge co-founder Jeff Gwynne worked on together at Bell Labs and Lucent. But SONET requires multiplexers at every junction. Quantum Bridge equipment eliminates the need for SONET gear and uses passive optical splitters and couplers instead.

Using Quantum Bridge's gear, carriers should be able to offer services between the 1.5M bit/sec of a T-1 and the 45M bit/sec of a T-3, says Rosemary Cochran, an analyst with Vertical Systems Group in Dedham, Mass. If a customer needs more bandwidth, the carrier can boost that customer's share of a wavelength via management software alone.

The technology seems particularly well-suited to transparent LAN services in which WAN connections run at full LAN speed, Cochran says. Quantum Bridge is the only company she knows of that is working on this type of gear.

The alternative to fiber distribution is installing a network of SONET multiplexers that are much more expensive, Cochran says.

Quantum Bridge is building two pieces of equipment: An optical access switch transmits and receives light signals at the carrier switching office. And customer-site gear, called an intelligent optical terminal, puts customer traffic on and takes it off the fiber.

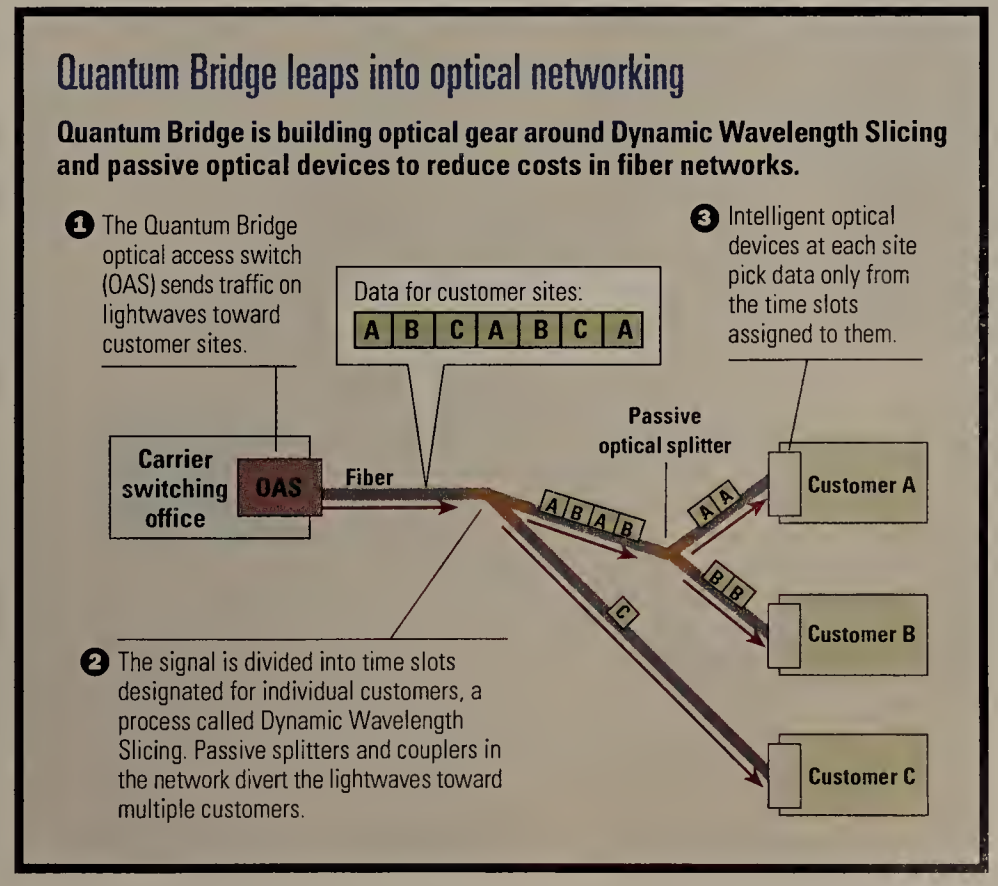
The optical signal is sent from the switch on a single fiber, and that signal can be split onto other fibers, like branches of a tree, using passive optical couplers. This lets a single light signal reach many customers.

The company will announce pricing in January, and the equipment will be available sometime before mid-2000. It will go into beta testing with carriers at year-end.

Quantum Bridge: www.quantumbridge.com

Quantum Bridge leaps into optical networking

Quantum Bridge is building optical gear around Dynamic Wavelength Slicing and passive optical devices to reduce costs in fiber networks.



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Backspin

Nothin' but 'Net and image

"I predict that by 2003 the major unit of international currency will be the Yahoo!"

— Jim Sterne, author, speaker and pundit who owes me lunch.

Branding. It is a central tenet of modern marketing that brands are to be vigorously built and defended. But what are brands? I'll take a stab at a definition: Brands are images that represent the intangible qualities of the brand owner and its products.

Perhaps the best example of this is Coca-Cola — the definitive brand of the 20th century. Coca-Cola, a k a Coke, has had the widest brand recognition of any modern product. But the Coca-Cola brand isn't about a carbonated drink that used to be made with cocaine — it is about a lifestyle, a feeling about the product and the company — "Things go better with Coke," goes the jingle.

MARK GIBBS

But is Coke still the top brand? No longer. A recent study by one of the automakers showed that among 16- to 24-year-olds, Coca-Cola no longer holds the No. 1 slot for brand recognition. Nope, Pepsi didn't replace Coke. Nor was it Ford, Kraft or any of the traditional players. It was (drum roll, please, maestro) ... Yahoo! Honest.

This is our first clue that branding online is very different from off-line branding. Online, a brand can grow at a rate that Madison Avenue couldn't have imagined in its wildest dreams. This is the result of pop culture meeting the 'Net ... it starts with 15 minutes of fame being spread and replicated ad infinitum by word of 'Net and ends accelerating the brand into orbit.

Now here's an interesting thing. Amazon has done what has traditionally been considered suicidal: The company has moved into a number of areas that have nothing to do with what it started out doing and became famous for — that was, selling books. Now it runs auctions and sells consumer electronics. Oh, and confectionery and lots more stuff.

The company's diversification started when Amazon began selling music and videos. No one was too shocked by that — CDs and videos are similar in distribution and pricing to books, so it was seen as a logical and smart extension of Amazon's focus.

But the entry into stereos, chocolates and video games was surprising, and the move into the territory of eBay even more unexpected. Amazon was doing what has been a disaster for many brick-and-mortar retailers — it was going outside of its core business and consequently diluting its brand.

Now I contend that it is virtually impossible for an established online property such as Amazon to dilute its brand. The only way it could happen would be through gross incompetence. Hell, even something as contentious as, say, Amazon operating a porno site under its name would probably do no damage.

You see, online, there is nothing but brand. Without real salespeople to interact with and real premises to walk into, and provided your content is relevant to your audience, you are judged solely on how you present your content. The company is its image, and the image is the company. And as long as you have a solid online style, everything under your brand is branded even if that stuff spans markets, sales strategies and cultures.

This means that companies such as Amazon can enter and leave markets with what, in traditional marketing terms, amounts to wild abandon, and suffer little or no brand dilution as long as they maintain their image and the context in which they communicate.

The message is clear: Online, your company is judged by its image and style. Everything else is content. Appearance is all.

Altered images to mrcolumn@gibbs.com

'NET BUZZ

The latest on the Internet/intranet industry

PAUL MCNAMARA

Do you know anyone who does not have e-mail? Between the two of us, a colleague and I came up with exactly two such people: my 73-year-old father, who doesn't even have an ATM card, and the colleague's grandmother, who while not having e-mail has still managed to send some from a neighbor's PC.

We are indeed a wired bunch, especially those of us who live and breathe this stuff in order to put food on the table and bring broadband into our homes.

But it's still worth remembering as we ride the caboose of the 20th century that we do have a rather skewed view of where the Internet stands in the grand scheme of things ... at least at this very moment. While there is every reason to believe the wired masses will continue to mushroom, a new survey from **Scarborough Research** gives a good read on how much headroom remains. The survey also sheds light on the geographic breakdown of that much-discussed disparity between Internet "haves" and "have nots."

According to Scarborough, five U.S. cities have exceeded 50% penetration in terms of the number of adults who can access the Internet at home or at work. Washington, D.C. ranks first with 59.9% online, followed by San Francisco (56.1%); Austin (55.5%); Seattle (53.3%) and Salt Lake City (50%). No shockers here, except perhaps for Salt Lake City (although anyone who has been to Novell's BrainShare conference will appreciate the role the Internet might play in supplementing that city's nightlife).

The bottom five, or least-connected, cities in the Scarborough survey, were Wilkes Barre, Pa. (32.8%); Charleston, W.Va. (32.4%); Tulsa, Okla. (32.3%); Birmingham, Ala. (32.2%); and Pittsburgh (30.8%).

One need not be a Harvard economist or dig too deeply into the demographic data to explain the disparities: Money talks on the Internet, just like it does everywhere else. A last data point from the research: Of the 170,000 adults surveyed in 64 top U.S. markets, 43.7% are online. Which means that more than half of American adults still don't have e-mail and aren't shopping online. I don't know them, and my colleague doesn't know them. But you can be sure my father and my colleague's grandmother know plenty.

Sometimes you can judge a start-up by the company it keeps ... as in the company from which it keeps getting money.

Vision Software — a maker of software designed to automate and simplify the process of building e-business applications — last week landed a $15.7 million mezzanine round of financing led by **Goldman Sachs**. Previous investors include **The Paul Allen Group, Hambrecht & Quist,** SAP co-founder **Hasso Plattner** and Netscape/AOL celebrity technologist **Marc Andreessen**.

While not willing to provide specific numbers, Vision executives say revenue is up 350% this year over last, and 120 new customers were signed on in 1999. In addition, the company recently announced a strategic arrangement with IBM to integrate Vision's e-business automation software with Big Blue's WebSphere Application Server.

Vision is targeting next quarter for an IPO. ... Could be a corker.

It was only a matter of time before Minnesota's cartoon character of a governor made his presence known on the 'Net. Here's the first line from a press release that crossed my desk recently:

"**Gov. Jesse Ventura** is the first U.S. governor to put his digital signature on a document, as the state of Minnesota this week becomes the first state in the country to adopt digital signature technology for secure Internet communications."

Bully for Minnesota and bully for Ventura. ... Who knew they could do digital signatures in crayon?

Readers are encouraged to forward Internet news tips, gossip items or messages for McNamara's Luddite dad to buzz@nwfw.com or (508) 820-7471.

*Estimated reseller prices for models: 240/21U & 570/2AU (price excludes UltraBase and other options; FDD/battery included). Actual prices may vary [1]Actual weight/thinness may vary due to vendor components, manufacturing process and options. Weight includes battery [2]Not preloaded, must be purchased separately [3]Options by IBM. mhz denotes microprocessor internal clock speed only; other factor

thinkpad.(dramatization)

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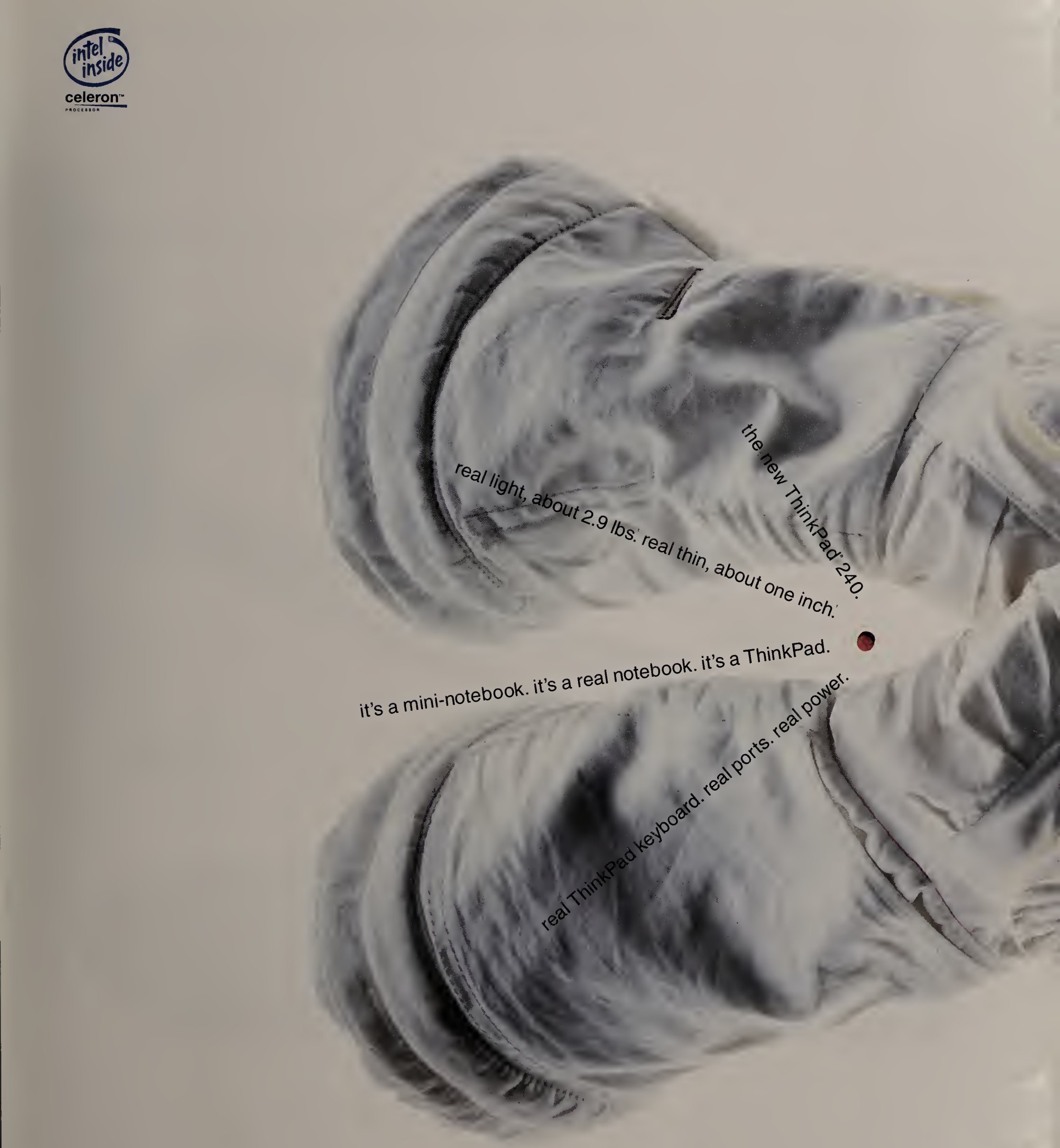

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